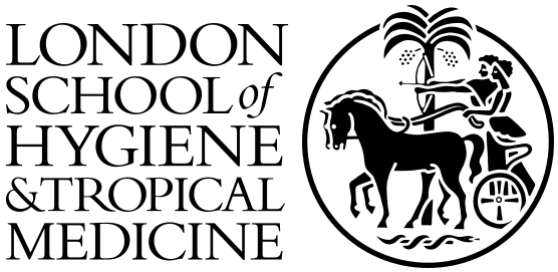

Determinants of partner violence in low and middle-income countries:

Exploring variation in individual and population-level risk

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Signed declaration

I, Lori L. Heise, confirm that the work presented in this thesis is my own. Information derived from other sources has been duly acknowledged herein

Signed:  September 25, 2012

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Abstract

Background: Lack of understanding of factors that contribute to an individual woman's risk of partner violence as well as factors that collectively account for the distribution of violence across settings, continues to compromise efforts to design effective prevention programs. Likewise, key methodological questions remain unanswered, most notably how best to conceptualize, capture, and measure partner violence for the purposes of research. This thesis attempts to bridge these gaps by analyzing the risk and protective factors of partner violence across a variety of low and middle-income settings, with an emphasis on Brazil and Peru.

Methods: The analysis herein draws on data from the WHO Multi-Country Study of Domestic Violence and Women's Health, a population-based survey that interviewed over 24,000 reproductive age women, in 15 sites about their experiences of violence. The thesis examines the patterning of partner violence in Brazil and Peru and explores the relative utility of using Latent Class analysis (LCA) compared with traditional WHO case definitions, to identify and classify cases of partner violence. It then uses generalized estimating equations to develop an explanatory model of the factors that best predict an individual woman's risk of experiencing severe partner violence, as identified by LCA. Later chapters present two ecological analyses: one that identifies the cluster-level factors in Brazil and Peru that emerge as most predictive of cluster-level prevalences of domestic violence; and a second analysis that uses the full WHO data set, 18 Demographic and Health Surveys, and a variety of United Nations and independent data bases to test various theories on how macro-level factors work to influence a country's overall level of partner violence.

Results: LCA categorizes cases of partner violence differently than the WHO case definition, although both tend to identify similar risk factors. The WHO approach, however, seriously underestimates the effect size for cases of serious violence. Without further research it remains unclear whether the categories identified through LCA represent fundamentally different "types" of partner violence as suggested by some research in high income countries, or merely differential groupings by serverity.

At an individual level, partner-related factors emerge as the most predictive of a woman's lifetime risk of partner violence, including exposure to violence as a child, level of controlling behavior, frequency of drunkenness, history of fights with other men and having outside sexual partners. Marital conflict, having more than two children, living together versus being married, not completing secondary school, and poor communication between the couple are also strongly associated with partner violence in both Brazil and Peru.

At a cluster level, the proportion of women completing secondary school, norms around male dominance, and the proportion of households in which a partner routinely comes home drunk are among the strongest variables predicting the cluster-level mean of partner violence. At a macro level, a range of variables related to women's status, gender inequality, social norms and overall level of socio-economic development predict a country's prevalence of partner violence. In multivariate analysis, norms related to the acceptability of wife beating and male control of female behavior, as well as women's access to formal wage employment appear the most strongly linked to the distribution of past year partner violence. A country's level of male drinking or male binge

drinking does not predict levels of abuse, illustrating that the factors that predict individual level risk can be different from those that predict population-level risk.

Conclusion: The next generation of research should focus on longitudinal and mixed method studies to help clarify the temporal associations among variables and identify how and why certain factors emerge as markers for risk.

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Acronyms and abbreviations

ACE	Adverse Childhood Experience
BIC	Baysian Information Criteria
CD	Conduct Disorder
CIRI	Cingranelli-Richards Human Rights Dataset
CSA	Child Sexual Abuse
CTS	Conflict Tactics Scale
DHS	Demographic and Health Survey
GEE	Generalized Estimating Equations
GGM	Gender Gap Measure
ILO	International Labor Organization
IPV	Intimate partner violence
LCA	Latent Class Analysis
OECD	Organization of Economic Cooperation and Development
OLS	Ordinary Least Squares (as in regression)
SA	Sexual assault
SES	Socio-economic status
SIGI	Social Institutions and Gender Index
WHO	World Health Organization

Acknowledgements

When I first embarked on this journey, a wise friend gave me this advice: Purchase a Bonsai tree and set it on your sill as a reminder that beauty sometimes lies in keeping things contained.

Enamored of this metaphor, Shira Saperstein, my good friend, helped me purchase a miniature fir tree as a guiding metaphor for this project. For the first nine months things went well, and then—quite abruptly, the Bonsai died—and I began to wonder about the nature of symbolism.

My husband bought me a second Bonsai and promised to help keep it alive (He, of course, had a personal interest in keeping the project pruned!) But alas this tiny tree also lost its leaves and eventually grew brown and brittle.

Fearing what a third symbolic death might portend for the thesis, I gave up on horticulture and looked directly to my friends, colleagues, and love ones for support and guidance. Fortunately, here I have had an embarrassment of riches.

My first and most profound thanks goes to Oona Campbell, my supervisor, who managed to walk that exquisite line between treating me as a colleague and mentoring me as a student. I will be forever grateful for her guidance, her faith in me, and her patience. I also thank the members of my advisory committee: Simon Cousens, Laura Rodrigues, George Ploubidis, and Charlotte Watts.

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I am also deeply indebted to the country teams in Brazil and Peru who graciously allowed me to use their data to further my learning and the larger political project of advancing partner violence research and practice. Thank you Anna Flavia D'Oliveira, Lilia Schraiber, Ivan Fraca-Junior, Simone Grilo Dinez , Ana Paula Portella and Ana Bernarda Ludermir, and the Peru team: Nancy Palomino, Ana Guezmes, and Miguel Ramos Padilla. And a special thanks to the wizardry of Stephanie Mitterhauser who saved me countless hours by getting unruly tables to line up in WORD.

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And finally, my most profound thanks goes to my partner and my colleagues and friends at the Centre for Gender, Violence and Health who collectively conspired to serve as my virtual Bonsai: They reminded me daily of the benefits of sleep, eating and taking time off in addition to deciphering latent class analysis and mastering quantile regression.

In closing, I could not have completed this thesis without the unconditional love and support of my partner Sheldon Annis, who spent many weekends and evenings alone but nonetheless always had a lovely meal and warm hug ready when I would arrive home at 10:00 at night. Sheldon, we met late in life, but I have learned so much from you already about gratitude, about supporting others in their quests, and about what is important. My deepest appreciation is for you.

Determinants of partner violence in low and middle-income countries

Overview of the thesis

Over a decade ago, the United Nations General Assembly called for increased research into the "causes, nature, seriousness and consequences" of violence against women, reflecting a growing global consensus that violence represents a fundamental violation of women's health and human rights (United Nations General Assembly 1993). Since then the research community has responded by generating a wealth of studies documenting the prevalence and health consequences of different types of abuse—in particular violence within intimate partnerships, the most common type of gender-based violence worldwide.

Population-based studies from around the world document that between 15% and 71% of ever-partnered women report having been physically assaulted by an intimate partner sometime in their lives (Garcia-Moreno, Jansen et al. 2006). The health and social consequences of this abuse can be profound. In addition to physical injury, violence has been linked to a host of long-term health outcomes, including depression, suicide attempts, miscarriage, chronic pain syndromes, gastrointestinal disorders, and increased risk of sexually transmitted infections (Coker, Smith et al. 2000; Campbell, Jones et al. 2002; Campbell 2002; Krug, Dahlberg et al. 2002; Bonomi, Thompson et al. 2006; Ellsberg, Jansen et al. 2008; Ruchira Tabassum and Nazneen 2008; Dude 2009). Partner violence has also been linked to negative health outcomes among the children of abused women, including elevated rates of diarrheal disease (Karamagi, Tumwine et al. 2007), decreased childhood immunization (Bair-Merritt, Blackstone et al. 2006), increased risk of acute malnutrition (Hasselmann and Reichenheim 2006), and excess infant and child mortality (Jejeebhoy 1998; Åsling-Monemi, Peña et al. 2003; Ahmed, Koenig et al. 2006).

Growing recognition of the consequences of violence, however, has not been accompanied by a parallel maturation in understanding its causes. The task of theory building has been hampered by fragmentation of the research base and the overwhelming dominance of studies based solely in North America. Lack of understanding of factors that contribute to an individual woman's risk of violence as well as factors that collectively account for the distribution of violence across settings, continues to compromise efforts to design effective prevention programs. Likewise, key methodological questions remain unanswered, most notably how best to conceptualize, capture, and measure partner violence for the purposes of research.

The goal of this thesis is to help bridge this gap by analyzing the risk and protective factors of partner violence across a variety of developing country settings, with an emphasis on Brazil and Peru. It will draw on data from a range of Demographic and Health Surveys (DHS) as well as the WHO Multi-country Study on Domestic Violence and Women's Health, a 10-country, 15-site study of domestic violence conducted in collaboration with country-teams, the London School of Hygiene and Tropical Medicine, and the Seattle-based NGO, PATH (hereafter, the WHO study).

Specifically, the aim and objectives of the thesis are as follows:

Aim

To inform the design and conduct of future research and prevention programming by exploring the nature of abuse in low and middle-income countries (using Brazil and Peru as case examples) and by identifying factors that influence individual-level risk and the geographic distribution of partner violence across settings.

Objective 1: To examine the patterning of distinct types of partner violence in Brazil and Peru using both the WHO case definition of partner violence (described hereafter as IPV-WHO) and an alternative method for identifying cases of abuse, using the technique of latent class analysis (LCA).

Objective 2: To identify and model individual- and relationship-level factors that affect the odds that a woman will experience partner violence, with a special emphasis on her risk of experiencing severe abuse.

Objective 3: To assess the ability of the traditional WHO case definition of partner violence to identify and estimate accurately the factors that increase a woman's risk of experiencing severe partner violence.

Objective 4: To evaluate the extent to which the above findings suggest that there are different subtypes of abuse in Brazil and Peru as implied by some research in high-income countries.

Objective 5: To explore what macro- and community-level variables are associated with the population-level distribution of partner violence across different geographic settings.

Gaps in our present understanding of partner violence

In pursuing this research, I hope to help close several significant knowledge gaps on the nature of abuse in low in middle income countries, as well as on the risk and protective factors for partner violence.

As detailed further in Chapter 2, the existing literature:

- Focuses almost entirely on risk factors for individual types of violence, with an historical emphasis on physical assault rather than operationalizing abuse as it is largely experienced—as episodes of physical violence in the context of emotional abuse, or as a pattern of severe overlapping types of violence, including physical, sexual and psychological violence.
- Concentrates heavily on individual-level risk factors, with little attention to factors that may operate within relationships, or at the community or country level;
- Examines risk factors related either to the woman or her partner, but seldom examines their combined influence;

- Pays little attention to causal pathways and thus either over or under-adjusts for potential confounders;
- Lacks comparability among studies, making it difficult to determine whether differences in risk profiles represent true differences between settings or merely differences in the operationalization and measurement of key variables; and
- Is biased toward the North American experience, especially with respect to studies that use more sophisticated methods such as latent class analysis or multi-level modelling.

In my analysis of partner violence in Brazil and Peru, I will address each of these limitations to the extent permitted by the data available from the WHO study. In addition, I will draw on data from all 15 sites of the WHO study to examine the degree to which the findings from Peru and Brazil appear consistent with multi-variable analysis of risk and protective factors across the full WHO data set.

I will also attempt to overcome the limitation posed by the field's current reliance on physical or sexual assault as a proxy for partner violence in risk and protective factor studies. This tradition persists in the literature despite numerous studies that demonstrate that both female and male victims consider emotional and psychological abuse as a defining feature of their experience. Even women who have suffered severe physical and sexual violence routinely cite the emotional abuse and intimidation as the most painful and enduring aspect of the violence (Follingstad, Rutledge et al. 1990; Watson and Parsons 2005). There is likewise emerging evidence that the health consequences of emotional abuse, either alone or in conjunction with physical or sexual violence, are substantial (Yoshihama, Horrocks et al. 2009; Jewkes 2010; Jina, Jewkes et al. 2011).

In this context, I will explore the utility of latent class analysis as a means to derive data-driven categories of abuse that combine information on emotional, physical, and sexual violence. I will use these categories to explore the patterning of violence in four sites in Brazil and Peru, and to compare the risk profiles generated by traditional methods of defining partner violence, with those that emerge using the latent class approach.

Finally, I will use ecological analysis at the level of the neighborhood in Brazil and Peru and across 40 separate countries to identify community-level and macro-level factors that appear associated with the population distribution of partner violence. In this way, I hope to generate a coherent body of work that will help further characterize the nature of abuse in low and middle-income countries, and yield insights into the factors that influence women's individual risk of abuse as well as those that shape the distribution of partner violence across populations.

Structure of the thesis

LSHTM recently increased the flexibility in how dissertations may be structured, allowing students to present their work in the traditional "chapter" format, as a series of "papers" accompanied by supplementary material, or as a combination of both. I have chosen a combination approach organized as follows.

The thesis consists of nine chapters and a recently published co-authored paper, which is included in Appendix A. Chapters 1 through 3 provide background reviews of relevant literature. Chapter 40 presents a global overview of the thesis methods. Chapters 5 through 8 present separate pieces of

analysis, including the questions guiding the analysis, detailed information on methods used, the findings that emerge, and a discussion of the chapter's results, including the strengths and weaknesses of the analysis. Chapter 9 presents a summary assessment of the thesis, including its main findings and their implications for future research and prevention planning. The summary table on the following page summarizes the entire thesis in diagram form and provides signposting for the reader, including which chapters address which objectives.

Specifically:

Chapter 1 provides an overview of existing knowledge and current debates on conceptualizing and measuring partner violence

Chapter 2 describes the evolution of theories on the causes of partner violence, summarizes current understanding of factors that change risk of violence at the individual and population level, and presents my conceptual framework.

Chapter 3 presents what is known from the developmental literature about how various risk factors interact over the life course to increase risk of partner violence and depicts these pathways in two diagrams designed to inform my model building.

Chapter 4 describes the data sets used for the thesis analysis, including the DHS surveys and the WHO multi-country study on domestic and women's health (WHO Multi-country study). It also provides an overview of the primary methods used in future chapters, including latent class analysis, population averaged logistic regression and linear regression.

Chapter 5 uses descriptive techniques and latent class analysis to explore the patterning of partner violence in Brazil and Peru. It also explores, whether there may be different "types" of partner violence as suggested by some research in the US and the UK.

Chapter 6 develops an explanatory model of the combined factors (from the woman, her partner, and their relationship) that best predict an individual woman's odds of experiencing partner violence. It reexamines the evidence on different types of violence, taking into account the multi-variable results generated therein.

Chapter 7 presents an ecological analysis of the community-level factors that are associated with the population prevalence of partner violence in different communities throughout Brazil and Peru.

Chapter 8 conducts a similar analysis at a country level, to determine which macro-level factors may influence the population-level distribution of partner violence.

Chapter 9 summarizes the thesis findings overall and makes recommendations to strengthen future partner violence research.

Finally, Appendix A presents a co-authored journal article ("What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on domestic violence and women's health"). This article compares risk and protective factors across all 15 sites in the WHO database. I helped conceptualize the analysis in this article based on the more in-depth work that I had been doing in Brazil and Peru. I incorporate the findings from this piece of work into the larger

literature review I present in Chapter 2 on what is known about risk and protective factors for partner violence in low, middle, and high-income countries. I return to this paper as well, when I summarize my findings and their implications in Chapter 9.

Table 0-1 Schematic overview of the thesis

	Related objectives	Topics covered and questions addressed	Methods
BACKGROUND & METHODS CHAPTERS **Chapter 1:** Conceptualizing and measuring partner violence	Background for: **Objective 1:** Exploring patterning **Objective 4:** Assessing possible sub -types of violence	How has partner violence been conceptualized and measured? • Controversies among researchers as to the nature of abuse • Emergent ideas around different "types" of partner violence	**Literature review**
Chapter 2: Explanatory theories and determinants of partner violence	Background for: **Objective 2:** Modeling individual an relationship level risk factors for partner violence **Objective 5:** Modeling community and macro-level factors that predict geographic distribution of prevalence	What theories have emerged to explain the risk of partner violence from different disciplinary perspectives? To what extent have these theories been combined to yield a coherent theory on the potential causes of partner violence? What factors are associated with risk of experiencing or perpetrating partner violence, according to existing literature from low and middle-income countries?	**Literature review**
Chapter 3: Hypothesized causal pathways for violence perpetration and victimization	Background for: **Objective 2:** Risk and protective factors for experiencing partner violence	What does the developmental literature suggest about how different factors interact over the life course to increase the risk that a man will perpetrate or a woman will experience partner violence? What does the above analysis suggest about which factors associated with partner violence should and should not be included in multi-variable analysis of a woman's risk of victimization?	**Literature review**

Chapter 4: Overview of methods	Methods related to: **Objectives 1 through 5**	***Description of data used*** • Description of the WHO Multi-country study (its design, sampling strategy, data quality, topics covered, and attention to ethical issues) • Specifics on the studies from Brazil and Peru • Details on how the WHO Study collects and analyzes data on partner violence • Description of violence module of the DHS survey ***Overview of methods*** • Handling missing data • Factor analysis • Latent class analysis as a technique to identify cases with a common latent structure • Generalized estimating equations as a means to model risk and protective factors in surveys using clustered data • Ecological modeling using linear regression • Ecological modeling using quantile regression	
RESULTS CHAPTERS **Chapter 5:** Exploring the patterning of partner violence in Brazil and Peru	**Related objectives** **Objective 1:** To examine the patterning of partner violence in Brazil and Peru using the WHO case definition and cases identified through Latent Class Analysis (LCA) **Objective 4:** evaluate whether there may be different subtypes of partner violence in Brazil and Peru as suggested by some research in high-income countries	**Topics covered and questions addressed** 1. What is the nature and patterning of lifetime partner violence in Brazil and Peru? How do different forms of violence inter-relate? 2. How do cases of violence identified through LCA compare to those using case definitions from the WHO study? 3. Do the violence types identified through LCA differ in health outcomes or risk and protective factors?	**Methods** **Factor analysis** **Traditional descriptive analysis** **Latent class analysis**

		4. How do the LCA categories relate to controlling behavior, and what does this imply about whether controlling behavior is a risk factor or a defining element of partner violence? 5. What does the above analysis suggest about the possibility of there being different subtypes of partner violence in Brazil and Peru?	
Chapter 6: Identifying individual and relationship-level factors that influence the odds of partner violence	**Objective 2:** To identify individual- and relationship-level factors that increase or decrease a woman's odds of experiencing partner violence **Objective 3:** To assess the ability of the WHO case definition of partner violence to yield accurate estimates of the risk factors for severe abuse	6. What respondent, partner, and relationship-related factors influence a woman's risk of experiencing lifetime partner violence? 7. Do these factors differ between systematic abuse and partner violence as defined in the WHO study (hereinafter referred to as IPV- WHO)? 8. Does relationship conflict and quarrelling appear to mediate the relationship between any of the factors and increased risk (i.e. does some of the effect appear to be a function of arguments about certain issues)? 9. To what extent are effect sizes influenced by the reference group chosen? 10. To what degree can analysis based on WHO's case definition of IPV yield accurate insights into risk factors for systematic abuse?	**Bi-variable analysis** **Population-averaged logistic regression, using generalized estimating equations (GEE)**
Chapter 7: Understanding the geographic distribution of partner violence	**Objective 5:** To explore what macro- and community-level factors are associated with the population-level distribution of partner violence in different geographic settings	11. Which neighborhood level factors are most strongly associated with the geographic distribution of partner violence in Brazil and Peru?	**Ordinary least squares linear regression**

Chapter 8: Exploring macro-level determinants of partner violence	**Objective 5**: To explore what macro and community-level variables are associated with the population-level distribution of partner violence in different geographic settings	12. Which macro-level factors are most strongly associated with the geographic distribution of partner violence across countries? 13. What do such findings suggest regarding macro-level policies that might help reduce overall levels of partner violence?	**Quantile regression**
Chapter 9: Synthesis and implications of findings for future research and practice	**Review of overall aim:** To inform the design and conduct of future research and prevention programming by exploring the nature of abuse in low and middle-income countries (using Brazil and Peru as case examples), and identifying factors that influence individual risk and the geographic distribution of partner violence.	14. What are the major findings of the thesis? 15. What methodological work and further research do they suggest? 16. What are the implications of the finding for the design and implementation of future programs aimed at preventing partner violence in low and middle-income countries	**Synthesis of findings**
Appendix A: What factors are associated with recent intimate partner violence?	**Objective 2**: To identify individual- and relationship-level factors that increase or decrease a woman's odds of experiencing partner violence)	17. What factors emerge as most consistently predictive of higher odds of recent partner violence across the multiple sites of the WHO Multi-country study?	**Logistic regression**

Chapter 1: Conceptualizing and Measuring Partner Violence

1.1 Emergence of partner violence as a social issue

In 1997, Egyptologist Brenda Baker unearthed a 4,000-year-old female skeleton whose bones bore telltale signs of a lifetime of physical abuse (Baker 1997). Despite this ancient provenance, violence against women and girls has been largely ignored for much of recorded history. It was only four years prior to Baker's discovery—at the Second World Conference on Human Rights in Vienna in 1993—that the international community first acknowledged that gender-based violence is a fundamental violation of women's human rights (Reilly 2009). It took almost 4,000 years—and all the countless eons before—for violence in the family to gain its rightful place as a worthy topic of moral outrage.

This recognition came on the heels of decades of advocacy by women's groups to draw attention to the issues of partner violence, child sexual abuse, and rape. Women's organizations in North America, the United Kingdom and parts of Latin America began organizing around domestic violence and rape in the early 1970s, setting up services, training the police, and lobbying for legal reform (Heise 1996). Small groups in Asia and Africa followed suit, trying to "break the silence" around violence in cultures that highly valued family privacy (Heise 1996). Because most mainstream institutions failed to embrace the issue, women's advocates soon became the "experts" on abuse, forging their theories through direct experience with victims.

During this era, most academics remained largely removed from the issue except for a handful of feminist scholars who began studying the experience of "battered women" more in depth (Dobash and Dobash 1979; Pagelow 1981). Clinicians such as Lenore Walker researched women seeking care at battered women's shelters (Walker 1979), and academics such as Rebecca and Russell Dobash interviewed victims and traced the history of wife beating in Western, male dominated cultures (Dobash and Dobash 1979). This early research was informed by feminist theory and largely relied on qualitative methods to capture the realities of women accessing the services newly created by the women's movement (Schecter 1982).

A handful of more traditional sociologists entered the field in the late 1970s and were the first to study partner violence among community-based samples of women. US researchers—most notably Richard Gelles and Murray Straus—conceptualized "spouse abuse" as one of a number of forms of aggression that takes place within the family. Their approach was grounded in "conflict theory" and argued that violence is one among many tactics that family members use to resolve disagreements (Straus and Gelles 1979). In 1980, this team became the first to develop a tool to measure the incidence and prevalence of violence in the American family. This instrument, known as the "Conflict Tactics Scale" has since gone on to become the most widely used instrument globally for

studying partner violence, having generating more than 400 peer-reviewed articles by 1996 (Straus, Hamby et al. 1996).

The Conflict Tactics Scale was revolutionary in its day because it introduced behaviorally specific probes to measure abuse. The CTS inquires about a range of tactics that couples use to resolve conflict, from negotiation and persuasion, up through threats and physical aggression. The last part of the scale—which measures physical violence—inquires about eight discrete behaviors that range in severity from "slapping" and "pushing, shoving or grabbing," to "beating up" and "threatened or actual use of a weapon." Men and women are asked to report whether they have used each of the acts against their partner or whether their partner has used the act against them. Researchers can either calculate a "chronicity score" for each partner based on the number and frequency of different acts that they have experienced, or define a dichotomous measure coded 0 or 1 indicating whether the respondent has experienced verbal or physical aggression within a specific time frame (usually within the previous 12 months or within one's lifetime)(Straus, Hamby et al. 1996). When used as a dichotomous measure, respondents who have experienced any of the listed acts of physical aggression are coded as a "case" of physical violence.

The CTS opened new horizons for domestic violence research because it allowed researchers to measure specific "acts" rather than rely on the meaning that culture or the respondent assigned to those acts. This meant for the first time, researchers had a way to capture broadly comparable data on violence across a wide range of settings. It also meant that researchers could begin to quantify the dimensions of the problem and to collect the type of incidence and prevalence data that policymakers find persuasive.

The CTS's focus on disembodied acts, however, has also been its greatest weakness. Feminist researchers have been highly critical of the instrument precisely *because* it de-contextualizes violence and counts every act as equivalent regardless of its consequence (Dobash, Dobash et al. 1992). It also fails to take into account sexual abuse, stalking, isolation or terrorizing, all common elements of wife abuse as revealed by qualitative studies of abused women (Yllo and Bograd 1988). Perhaps most problematically, the CTS fails to distinguish between offensive and defensive acts, essentially equating offensive violence and acts of retaliation or self-defense (Pleck 1987). Although Straus revised the CTS in 1996, adding several questions on sexual assault and injury to address the concerns of critics, dissatisfaction with the CTS continues to this day in some quarters.

1.2 Evolution in strategies for conceptualizing and measuring abuse

The debate over the CTS actually reflets a deeper divide in the community of scholars and practitioners who work on partner violence in high-income countries. Since the 1980s, the Western academic community has been embroiled in a longstanding debate over the fundamental nature of abuse.

Feminist researchers and activists have long placed wife abuse or "battering" within the spectrum of other forms of violence against women, which are seen as manifestations of male dominated ideologies, cultures and institutions. As noted earlier, these practitioners and academics forged their understanding of abuse by interacting primarily with women in contact with formal services

who generally represent the extreme end of the violence spectrum. They argue that coercive control and psychological manipulation are fundamental to the experience of abuse. As a strategy to maintain control over one's partner, it cannot be captured adequately through simple surveys that measure discrete acts of physical assault divorced of context, motivation, and meaning (Smith 1994; Smith, Smith et al. 1999). These scholars also emphasize that battering includes multiple overlapping forms of abuse and must be conceptualized and measured as such.

By contrast, researchers working from the "family violence" perspective (as it has come to be known) have generally conceptualized violence as a form of aggression that individuals resort to out of anger, frustration, stress or an inability to resolve conflict (Kurz 1989). They have prioritized large-scale surveys of representative samples of families using the CTS to measure physical violence and psychological aggression between couples, directed at children and among siblings.

To this mix, also came researchers working from a criminal justice perspective, who sought to capture and measure those aspects of violence against women that might appropriately be categorized as crimes. Most high-income countries had been conducting routine victimization surveys to assess levels and trends in crime. Beginning in the 1990s, several countries, including the United States, Canada, Australia, Finland and Iceland, developed specialized versions of these surveys focused exclusively on crimes against women (Johnson and Sacco 1995; Tjaden and Thoennes 2000; Walby and Myhill 2001). Because these surveys asked respondents about abuse in the context of "crime" or "women's safety," they tended to cue women to acts on the more extreme end of the violence spectrum (Walby and Myhill 2001; Kilpatrick 2004). As a result, large-scale victimization surveys have tended to yield lower estimates of partner violence than surveys using the CTS, which frames questions on violence in the context of conflicts and disagreements (Walby and Myhill 2001; Langhinrichsen-Rohling 2010).

Given the intellectual divide, it is not surprising that various communities of scholars have developed distinct approaches to defining and measuring partner violence. Despite their ideological differences, researchers from all camps have recognized the special role that quantitative prevalence data can play in helping make visible social issues that were once hidden.

Researchers working from the family violence or social work perspective have continued to use the CTS, gradually shifting since 2000 to the revised CTS-2. This was an important step because the CTS-2 started generating data on sexual as well as physical aggression within intimate relationships.

Individuals working from a feminist perspective developed a number of topic-specific instruments—such as the "Measure of Wife Abuse" and the "Severity of Violence Against Women" scale—that collected information on a wider range of behaviors than those captured by the CTS (Thompson, Basile et al. 2006). These instruments increasingly focused on the psychological and controlling aspects of abuse as would be expected given their salience within feminist conceptions of abuse. The 1998 Women's Experiences of Battering Scale (WEB scale), for example, focused explicitly on detecting abuse by measuring how it made women feel. Rather than inquiring about specific acts, the WEB scale included items such as: "He makes me feel unsafe even in my own home" and "I feel ashamed of the things he does to me" (Smith, Earp et al. 1995; Smith, Smith et al. 1999).

While more sensitive to context and meaning, these instruments tended to be longer and more cumbersome to administer than the CTS. They worked well in clinical or assessment settings but were less appropriate for population-based research. In addition, they had been derived almost exclusively from the experience of battered women in the United States and it was not clear the extent to which they would capture the experience of partner violence in other cultural settings. As a result, many of the first generation surveys of partner violence in nonwestern settings either adapted the CTS or used novel questions developed by the investigators.

The relative inattention to domestic violence in nonwestern nations changed swiftly in the run up to the Fourth World Conference on Women held in Beijing, China in 1995. With increasing focus on women's human rights, pressure mounted to generate more data on violence against women in the developing world. A number of important initiatives to collect such data commenced in the wake of the conference, including a multi-country study on violence in the family, called WORLDSAFE (1996-1994), implemented by the International Clinical Epidemiology Network (INCLEN), the development of a standard module on domestic violence for use in the ongoing Demographic and Health Surveys conducted in low-income countries; and the launch of the WHO Multi-country Study on Domestic Violence and Women's Health in 1997 (Kishor 1996; Garcia-Moreno 2002; Sadowski, Hunter et al. 2004). More recently, the European Institute for Crime Prevention and Control and the United Nations Interregional Crime and Justice Research Institute (UNICRI) have launched their own effort to support countries to implement the International Violence Against Women Survey, a population-based victimization study modeled after Canada's Women's Safety Survey. Collectively, these efforts greatly increased the amount of data available globally on the prevalence, nature, and impact of partner violence and of other forms of violence against women, especially in the developing world. There are now more than 200 population-based studies of partner violence globally (Devries 2010).

Despite significant growth in the scale and breadth of research, certain fundamental questions have not yet been resolved on the nature of abuse. For example, does a single incident of aggression constitute "partner violence," or must a pattern of repeated acts be involved? How central is the issue of coercive control or perpetrator motivation to the definition of partner violence? Should measurement of violence include an appraisal of impact on the victim and is there a threshold level of impact that should be reached before a constellation of behaviors should qualify as a "case" of partner violence? How important is it to include emotional or psychological abuse?

As Evan Stark, a long time domestic violence researcher observed in 2006, "Thirty years of research has failed to produce consensus on what constitutes a 'case' of domestic violence. . . making it impossible to rationally allocate or evaluate services (Stark 2006)." Faced with this reality, the field has recently entered a period of self-reflection and renewed experimentation. Investigators have begun to explore alternative ways to operationalize the study of partner violence, including new questions on existing survey instruments that capture the impact and meaning of violence, and exploring continuous rather than dichotomous measures. They have deployed more nuanced methodologies, such as latent class analysis (LCA), which have provided new insights to the challenge of defining and measuring abuse (see Section 1.4). Most of these innovations, however, have not yet been applied to the study of partner violence in low and middle-income countries.

There is also renewed interest in distinguishing between more and less severe cases of partner violence. Several studies, for example, have added questions on the extent to which the reported behaviors have had a negative impact on the respondents' life, and/or induced fear or distress (Watson and Parsons 2005; Graham, Bernards et al. 2008). The 2004 study on domestic abuse in Ireland, for example, makes a distinction between "severe domestic abuse" and "minor incidents," defining domestic abuse as: "A pattern of physical, emotional or sexual behavior (not just a single act) between partners in an intimate relationship that causes, or risks causing, significant negative consequences (physical injury, high levels of fear or distress) for the person affected." The report goes on to note:

> If we were to consider all isolated instances of pushing, shoving or name-calling as 'domestic abuse', this would lead to a misleading picture of the prevalence of abuse, the impact on those affected and the profile of those most at risk. Nonetheless, such forms of behavior should not be ignored or excused as to do so could be seen as legitimizing severe abuse (Watson and Parsons 2005) p.23.

1.3 Exploring potential heterogeneity in partner violence

1.3.1 The gender symmetry debates

One area of active exploration in the field is whether there may in fact be more than one type of partner violence within intimate relationships. Until recently, international researchers, practitioners, and advocates have implicitly treated partner violence as a unitary phenomenon. Little thought has been given to whether it actually represents a wider range of phenomena, each with potentially different trajectories, etiologies, and implications for health.

This provocative thesis was first advanced by US researcher Michael Johnson as a way to reconcile seemingly contradictory data that had emerged in Western countries on the relative frequency and severity of violence perpetrated by women versus men in intimate relationships. Large-scale studies that used the CTS routinely found that women appeared to engage in relationship aggression as frequently as men. A meta-analysis of primarily community and student samples from the United States, for example, revealed that when act based measures were used, women were slightly more likely than men to use physical aggression against an intimate partner (Archer 2000). While such surveys generally found that women suffered more severe consequences than their male counterparts (Felson and Cares 2005; Williams and Frieze 2005), they nonetheless were in stark contrast with the picture painted by justice system, emergency room, and shelter statistics, all of which indicated that violence by men against their female partner was the dominant social problem.[1] They also contradicted the findings of researchers working with women recruited from agency samples or battered women shelters.

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[1] For example, 84% of all cases of cases of partner violence that came to the attention of the police in Canada in 2004 were female victims, while 16% involved male victims (Canadian Centre for Justice Statistics 2007).

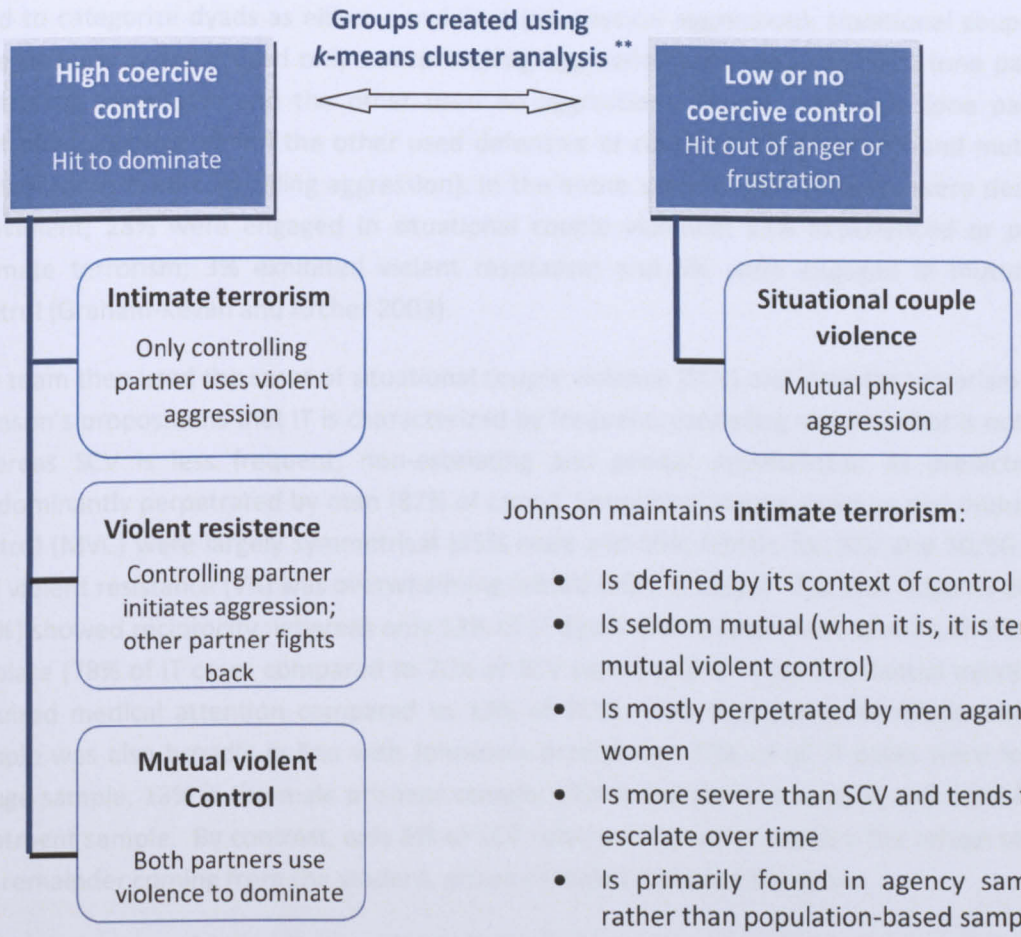
Years of acrimonious debate ensued as researchers attempted to unpack and understand their conflicting findings (Dobash, Dobash et al. 1992; DeKeseredy and Schwartz 1998; Kimmel 2002). Those favoring or attempting to debunk the gender symmetry hypothesis became locked in an ideological battle. Then in 1995, Johnson published a provocative thesis: Perhaps researchers were finding different realities because they were in fact studying two different phenomena. Johnson hypothesized that there may be two distinct types of violence, one he called *common couple violence* (later renamed *situational couple violence*) and another *patriarchal terrorism* (later renamed *intimate terrorism*), that are distinguished by the presence or absence of high levels of coercive control (Johnson 1995). He later expanded this model to include two additional subtypes of aggression, *violent resistance* and *mutual violent control* (Johnson and Ferraro 2000).

Johnson thus posits four specific types of domestic abuse that vary along predictable dimensions: intimate terrorism (IT); violent resistance (VR), which is utilized in response to IT; situational couple violence (SCV) and mutual violent control (MVC). Intimate terrorism usually involves patterned violence whose purpose is to maintain domination or control over one's partner. It is typically found in agency samples (e.g. among women seeking services) and tends to be persistent, frequent, escalating, and more severe. By Johnson's account, IT is much more likely to be enacted by men against their female partners (who may or may not use violent resistance). Situational couple violence, by contrast, is not related to power or control and is less severe, more episodic, and is perpetrated as frequently by women as by men (Johnson 1995; Johnson and Ferraro 2000). Johnson hypothesized that population-based surveys using the CTS picked up primarily the less severe, situational violence that was more likely to be mutual. They missed however, the more hidden, extreme phenomenon that advocates called "battering" and he termed "intimate terrorism."[2]

Justice system statistics from Ireland, the United States, and Great Britain likewise find that the number of female victims greatly outnumber those of men (Walby and Allen 2004).

[2] Interestingly Johnsons' most recent writings posit a three-group typology: Intimate terrorism, violent resistance, and situational couple violence Johnson, M. (2008). A typology of domestic violence: Intimate terrorism, violent resistance, and situational couple violence. Boston, Northeastern University Press.

Figure 1.1 Depiction of Johnson's typology of partner violence



Johnson maintains **intimate terrorism**:

- Is defined by its context of control
- Is seldom mutual (when it is, it is termed mutual violent control)
- Is mostly perpetrated by men against women
- Is more severe than SCV and tends to escalate over time
- Is primarily found in agency samples rather than population-based samples

** k-means cluster analysis partitions data into k clusters by maximizing the spatial separation between them(Kaufman and Rousseeuw 2008)

1.3.2 Testing the Johnson hypothesis

Several research groups have attempted to test Johnson's hypothesis, generally finding mixed support for his thesis (Johnson 1995; Smith, Thornton et al. 2002; Campbell, Webster et al. 2003; Graham-Kevan and Archer 2003; Watson and Parsons 2005; Frye, Manganello et al. 2006).

Graham-Kevan and Archer, for example, tested the hypothesis on British samples drawn from student surveys (N=208), refuge populations (N=86), men involved in voluntary perpetrator treatment programs (N=8), and male inmates in prisons from the North of England (N=192). Each respondent provided data for themselves and their partner on the frequency and type of physical violence perpetrated, number of controlling behaviors, the extent to which the violence escalated and its severity as indicated by injury. Cases of physical aggression were divided according to whether they took place in the context of high control versus low or no control (based on the

clustering of cases in response to questions related to five dimensions of controlling behavior: economic, threats, intimidation, emotional abuse, and isolation.[3] These distinctions in turn were used to categorize dyads as either nonviolent (no physical aggression); situational couple violence (one or both partners used only noncontrolling aggression); intimate terrorism (one partner used controlling aggression and the other used no aggression); violent resistance (one partner used controlling aggression and the other used defensive or retaliatory aggression); and mutual violent control (both used controlling aggression). In the entire sample, 49% of dyads were designated as nonviolent; 28% were engaged in situational couple violence; 11% experienced or perpetrated intimate terrorism; 3% exhibited violent resistance; and 6% were engaged in mutually violent control (Graham-Kevan and Archer 2003).

The team then used the cases of situational couple violence (SCV) and intimate terrorism (IT) to test Johnson's propositions that IT is characterized by frequent, escalating violence that is not reciprocal whereas SCV is less frequent, non-escalating and gender symmetrical. As predicted, IT was predominantly perpetrated by men (87% of cases). Situational couple violence and mutually violent control (MVC) were largely symmetrical (45% male and 55% female for SCV and 50/50 for MVC[4]); and violent resistance (VR) was overwhelming female (90% of cases). The vast majority of SCV cases (78%) showed reciprocity, whereas only 13% of IT dyads did. IT cases were also much more likely to escalate (78% of IT cases compared to 20% of SCV cases) and to cause substantial injury (43% of IT required medical attention compared to 13% of SCV). The distribution of relationship types by sample was also broadly in line with Johnson's predictions: 70% of all IT cases were found in the refuge sample, 13% in the male prisoner sample, 17% in the student sample, and none in the male treatment sample. By contrast, only 6% of SCV relationships were found in the refuge sample, with the remainder coming from the student, prison or male treatment surveys.

Although these and other findings (including Johnson's own test of his thesis based on US data provided by Frieze) provide some support for his hypothesis, some of the concordance may be due to the samples chosen and the authors' choice of analytic strategy. For example, since refuge and shelter populations are composed entirely of women, it is not surprising that the data highlight the "maleness" of intimate terrorism. Samples from shelters provide less of a chance of finding female-initiated intimate terrorism. Indeed, if the shelter data are omitted from the British sample, the female-to-male ratio of experiences of IT changes from 9:1 to 2:1.

Johnson also argues that what distinguishes intimate terrorism is that it is intended to dominate or control one's partner. Both the US and UK studies, however, isolate cases of IT precisely by identifying those cases where physical aggression takes place in the context of high control, a

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[3] Cluster analysis of responses yielded a two-factor solution, designated high versus low control. High controllers used economic control more than 3.5 times more frequently than low controllers, threats more than 5 times more frequently, intimidation nearly 6 times more frequently, emotional abuse nearly 5 times more frequently , and isolation nearly 5 times more frequently.

[4] With mutual violent control, the violence is by definition symmetrical. The difference between MVC and SCV is the context of high control and the motivation of the violence.

somewhat tautological argument. Might the distinction be one of degree rather than type? It may be that high control and emotional abuse are markers of severity and that severity of the abuse, not its motivation, accounts for the other differences observed. For example, in a re-analysis of the UK sample, Graham-Kevan and Archer found that at the level of the individual, control accounted for a significant proportion of the variance in the use of physical aggression across all the subtypes of violence, including those thought to be perpetrating situational couple violence (Graham-Kevan and Archer 2008). This finding is largely inconsistent with Johnson's hypothesis because variation in the level of control is the defining feature of Johnson's typology. Moreover, both Graham-Kevan and Johnson used measures of "control" that included both threats and sub-scales related to emotional abuse, thus potentially conflating these behaviors with controlling tactics.

A similar issue is raised by Frye and colleagues in their study testing the Johnson model using data from a representative sample of 331 physically assaulted women and matched community controls from 11 North American cities. They found that 69% of physically assaulted women experienced one or more controlling behaviors and 34% experienced three or more. By comparison, just 11% of the 418 non-assaulted controls experienced any controlling behaviors. Moreover, the average number of controlling behaviors among assaulted women was 1.79 (SD=1.64), compared to near zero for the non-assaulted women, suggesting that even women experiencing what would be termed "situational couple violence" had experienced coercive control. The authors observe: "From this one might conclude that there may not be as sharp a demarcation between the two hypothetical forms of IPV as has been proposed but rather a continuum where both controlling behaviors and injury and violence escalation are just three factors that characterize the various forms of IPV" (p. 1303)(Frye, Manganello et al. 2006).

Other researchers have sought to resolve these gender-related debates by asserting that there are different subtypes of violent men (Holtzworth-Munroe 2005) (Waltz, Babcock et al. 2000) (Holtzworth-Munroe, Meehan et al. 2000) (Gottman, Jacobson et al. 1995). One of the most influential perpetrator typologies was articulated by Holtzworth-Monroe and Stuart in 1994. Based on 15 previous typologies, Hotzworth-Monroe and Stuart observed that all the previously identified subtypes could be classified along three separate axes: 1) the frequency and severity of their violence; 2) the degree to which their violent behavior generalized outside of the family; and 3) their degree of personality disorder. Based on these dimensions, Holtzworth-Munroe and Stuart identified three different types of perpetrators: family only (FO), borderline/dysphoric (BD), and generally antisocial and violent perpetrators (GVA) (Holtzworth-Monroe and Stuart 1994).

Family only (FO) abusers are most similar to Johnson's situational couple violence in that they engage in the least amount of violence, and their violence seldom extends outside the home. They are psychologically healthy, but occasionally resort to violence if they become stressed or a marital argument escalates out of control. The dysphoric or borderline perpetrator (BD) exhibits high levels of jealousy, has intense fears of abandonment, and often demonstrates hostile attitudes toward women. Their physical violence is moderate to severe and generally accompanied by psychological and sexual abuse. This group resembles the batterers studied by Dutton, who hypothesizes that early traumatic experiences lead to borderline personality organization, anger and insecure attachment, which in turn can lead to violence against adult attachment figures (e.g. intimate partners)(Dutton 1995). The generally antisocial and violence perpetrators (GVA) also engage in

moderate to severe abuse and have the highest level of violent and criminal behavior outside of the home. They frequently experienced high levels of violence in their birth family, developed behavior problems in school, and became increasingly involved with delinquent and aggressive peers during adolescence. They are also the most likely to have alcohol and drug problems and to feel the least remorse or guilt because of their behavior.

Despite the intuitive appeal of such categories, several studies have been unable to fully replicate these original typologies (Waltz, Babcock et al. 2000; Del Sol, Margolin et al. 2003; Babcock, Costa et al. 2004) and later studies have had to add additional categories to accommodate new variations (Holtzworth-Munroe, Meehan et al. 2000). More recently, some researchers have become critical of attempts to categorize offenders by type, noting that thus far the typologies have not been sufficiently stable to be useful in guiding clinical or intervention decisions. Capaldi and her colleagues, for example, have argued that the unit of analysis for violence studies should be couples rather than perpetrators and that we should strive to evaluate dyads along multiple dimensions rather than construct static typologies (Capaldi and Kim 2007). Longitudinal research has shown that there is also substantial change over time in couples' relationships, including among the behaviors that were the foundation for the construction of the original typology (Holtzworth-Munroe, Meehan et al. 2003).

1.3.3 Critical assessment of the heterogeneity literature

In my view, the major contribution of the Johnson hypothesis and the typology literature has been to highlight the possibility that not all cases of partner violence are necessarily alike. Exactly how they differ and whether this difference is one of "type" or "degree," however, is still an open question. Efforts to substantiate both the Johnson hypothesis and various typologies have been undermined by lack of data appropriate to the task. For example, few studies have had data from both men and women to assess mutuality of violence. In addition, efforts to validate the hypothesis have relied on questionable and ever-changing measures of coercive control, and some conflate elements of emotional abuse with control.

Indeed, the findings of several more recent studies are equally consistent with the view that controlling behaviors are a risk factor for severe abuse rather than the core motivation for the behavior (Frye, Manganello et al. 2006; Anderson 2008). As suggested by the typology studies, controlling behaviors could be a marker for psychopathology, such as antisocial or borderline tendencies that are linked to more frequent use of severe violence. Or in settings where male dominance is normative, as in many low-income countries, it might represent internalization and enactment of certain gender norms granting men the right to control female behavior. In this case, controlling behaviors may be a marker for norms that encourage constructions of masculinity linked to male authority, entitlement and control. It is premature to draw conclusions about the trustworthiness of the intimate terrorism versus situational couple violence distinction until we understand more about the nature of control and how to measure it.

At the same time, there is merit in continuing to explore how different perpetrators and/or violent relationships may differ, and whether different experiences of abuse may have different antecedents or situational trajectories. An important lesson from past research is that women tend to experience violence not as discrete acts, but as constellations of physical, sexual and emotional

abuse. But the legacy of the CTS is that researchers tend to analyze and report abuse in terms of types of violence—physical assault, sexual violence, or emotional abuse—rather than how women experience violence in all its overlapping forms. We need better methods to capture and accommodate this complexity.

1.4 Latent class analysis as a new approach to defining abuse

One important methodological advance in this regard has been the exploratory use of latent class analysis (LCA) to move towards a "data informed" means of defining cases of abuse rather than relying on act-based definitions. LCA is a powerful analytic tool that uses statistics to divide a population into a number of "latent" unobserved groups or classes based on a range of observed "indicator" variables. It is especially useful for discovering "subtypes" of related cases (or confirming hypothesized subtypes) based on multi-variable categorical data (Collins and Lanza 2010).

In the last decade, a handful of researchers have used LCA as a means to define abuse and to interrogate whether violence is a unitary phenomenon. Researchers in both Ireland and Great Britain, for example, used LCA as a means of identifying severe versus less severe cases of abuse as part of their national victimization surveys on domestic violence (Walby and Allen 2004; Watson and Parsons 2005). As the Irish crime survey observes:

> A number of authors have suggested that the findings from different types of studies apply to different groups of people and reflect different aspects of domestic violence. Most of the behavior captured in Family Conflict studies is relatively minor and relatively infrequent, whereas the large part of that captured by crime surveys and clinical studies is severe. Since the prime concern in the present project is with implications for the Criminal Justice system, the consequences and impact of the behavior and its pattern need to form a core part of the concept (p.37)

As such, the Irish crime survey used LCA to combine information on acts of physical, sexual and emotional violence together with information on the frequency of these acts and their impact on the respondent's life in terms of distress, fear, self-reported impact, and/or injury, to identify cases of abuse for the purposes of their study. They identified three groups of people. The first and largest group, accounting for 72% of the population, consisted of people who had never experienced any of the incidents in their life. The second group, constituting 17% of the population, experienced minor incidents that did not have a severe impact on them. The final group included individuals who had experienced a pattern of behavior with significant impact on their lives. It is this category of severe abuse—seen in 11% of the population—that the authors define as the outcome for their study.

Other researchers have employed LCA to help differentiate patterns of IPV in Canada and in the United States (Macmillan and Gartner 1999; Carbone-Lopez, Kruttschnitt et al. 2006). Both the US and the Canadian study identified four patterns of IPV: a no violence group, an interpersonal conflict group characterized by relatively isolated acts of low-grade violence; a third group characterized by more varied, but still mostly moderate acts of physical aggression; and a final pattern—termed systematic abuse—that involved extensive and multifaceted violence, including stalking, sexual assault, choking and beating.

Macmillan and Gartner, for example, used the above LCA-derived categories and data from Canada's 1993 Violence against Women Survey to explore the impact of women's employment on the risk of spouse abuse (Macmillan and Gartner 1999). They found that the effect of women's employment was modified depending on whether her partner was employed or not. Employment almost tripled a woman's odds of suffering systematic abuse [aOR 2.86] when her male partner was unemployed, yet moderately reduced her risk of violence when her partner was employed [aOR 0.61]. The authors also found that the level of coercive control increased across the different categories of abuse, with the least control associated with the interpersonal conflict group and the greatest control associated with the most severe "systematic" category.

Carbone-Lopez and colleagues used LCA and data from the US Violence Against Women Study to examine differences in health outcome across a wide array of measures, including physical disability, psychological distress, mental illness and increased substance use. Both women and men experienced similar types of IPV, although within each class of violence the prevalence was significantly greater in women. [The 12-month prevalence of systematic abuse, for example, was 3.5% in women and 1.6% in men]. Likewise, while both sexes suffered negative health effects, the impact on women appeared greater. Women had higher odds of poor outcomes (higher adjusted odds ratios) in 26 out of the study's 37 health-related measures, whereas men showed higher odds on 11 indicators. The authors hypothesize that this gender disparity, which exists across all violence classes, is likely due to the greater severity of violence experienced by women compared to men (Carbone-Lopez, Kruttschnitt et al. 2006).

Other authors have employed LCA to test Johnson's thesis about situational couple violence versus intimate terrorism. Ansara and Hindin, for example, used data from Canada's 2004 General Social Survey on Victimization to explore gender differences in the patterns of partner violence (Ansara and Hindin 2009). They identified six unique classes of violence for women and four for men (including the no violence group). Women and men were equally likely to experience less severe acts of physical aggression that were not embedded in a pattern of control. However, only women experienced the most severe pattern of chronic violence and coercive control, involving high levels of fear and injury—a finding consistent with Johnson's hypothesis. The study also documented that contrary to Johnson's assertion, population-based surveys can pick up the most severe types of abuse, but only if they ask about ex-partners (many of the women who suffered the most severe abuse had left that relationship).

Together these studies underscore the utility of LCA for classifying types of violence, but there is yet no consensus about how best to apply the technique. As illustrated in Table 1.1, studies vary greatly in their choice of input variables (known as "indicator variables") and whether they include variables to capture aspects of abuse such as frequency, motivation and impact, as well as the presence or absence of different acts of physical and sexual aggression.

Table 1.1 Description of studies using latent class analysis to define cases of partner violence

Study	Sample	Types of partner violence	Other domains included
Carbone-Lopez, Kruttshnitt and Macmillan, 2006	Probability sample of 16,005 US men and women interviewed by phone as part of the National Violence Against Women Survey conducted in 1999	Physical acts (7 items) Sexual assault Stalking	
Watson and Parsons, 2005	Probability sample of 3,077 men and women interviewed by phone as part of the 2004 National Study on Domestic Abuse in Ireland	Physical acts (11 items) Sexual abuse[5] (4 items) Emotional abuse (11 items)	Fear/distress Self-reported impact Frequency Injury
Ansara and Hindin, 2009	Probability sample of 23,766 men and women interviewed by phone as part of Canada's 2004 General Social Survey	Physical acts (9 items) Forced sex (1 item) Verbal abuse	Controlling behavior
Macmillan and Gartner, 1999	Probability sample of 12,300 women interviewed by phone as part of the 1993 Violence Against Women Survey in Canada	Physical acts (9 items) Forced sex (1 item)	
Follingstad et al., 1991	Convenience sample of 234 women with a history of physical abuse recruited via flyers placed in women's shelters, women's prisons, grocery stores, doctors' offices and other locations in South Carolina, USA	Physical acts (11 items) Sexual assault	Frequency Injury Child sexual abuse Escalation Help-seeking Predictability Emotional state

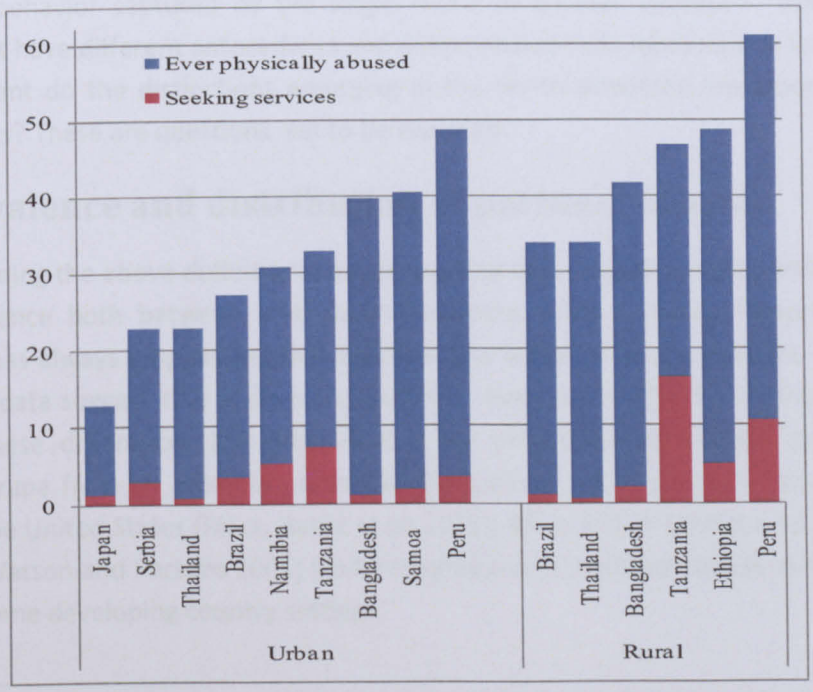
[5] Includes forced to have sex; tried to force to have sex; forced to watch or read pornography; forced to engage in another type of sexual activity.

At this point, it probably remains appropriate to encourage a degree of heterogeneity in choice of inputs as scholars explore the relative utility of different approaches. Nevertheless, if latent class is to be useful for defining outcome variables and comparing typologies of violence across settings, the field will eventually need to converge upon a common approach and set of indicator variables.

1.5 Insights from low and middle-income settings

Until now, I have drawn insights primarily from the industrialized world because the vast majority of research on the nature of partner violence has taken place in high-income countries. While women's groups in Asia, Africa and Latin America have conducted in depth qualitative research with victims of partner violence, these studies have primarily recruited women from shelters and formal services. As the WHO Multi-country study documents, however, this represents only the smallest segment of women who have experienced partner violence in the developing world (World Health Organization 2005). In all sites (see Figure 1.2), less than 16% of physically abused women had ever sought help from formal services or from individuals in authority (e.g. a village or religious leader). Two thirds of physically abused women in Bangladesh and about one-half of assaulted women in Samoa and Thailand province had *never told* anyone about the abuse prior to the interview (World Health Organization 2005). Almost none had sought help from shelters, women's organizations or social services, suggesting that qualitative interviews of abuse victims in low-income countries may be biased toward the more severe cases of abuse, as has been true in the West.

Figure 1.2 Percent of women seeking help from formal services or persons in authority, WHO Multi-country study



It is yet unclear whether the distinctions in types of abuse hypothesized to exist in industrial countries, exist as well in low and middle-income countries. One early effort to try to differentiate among types of abuse in the developing countries was offered by Counts and her colleagues in their ethnographic review of wife abuse in 14 nonwestern societies (Counts, Brown et al. 1992). This

volume draws a distinction between "wife beating," socially tolerated hitting that is conceptualized as chastisement, and "wife battering," a more severe form of abuse that can result injury or even death. Some communities disapprove of both wife beating and wife battering and sanction both negatively, whereas others tolerate wife beating, but censure more extreme forms of violence.

Indeed, there is extensive evidence that much physical abuse of women is conceptualized as "chastisement" for errant female behavior (Zimmerman 1995; Schuler, Hashemi et al. 1996; Rao 1997; Go, Johnson et al. 2003). In large portions of the developing world, husbands are granted the social right—indeed the duty—to "educate" or "correct" women whose behavior transgresses norms of expected female behavior (Heise and Garcia-Moreno 2002). This type of physical reprimand is largely condoned by both men and women as long as it is perceived as being for a "just cause" and does not exceed culturally defined limits of severity. As the author of one study from Pakistan notes: "Beating a wife to chastise or to discipline her is seen as culturally and religiously justified...Because men are perceived as the 'owners' of their wives, it is necessary to show them who is boss so that future transgressions are discouraged (Hanson 2000)."

There is ample evidence also that the type of severe, repeated abuse known as "battering" in the North American literature, exists as well in the rest of the world. Studies from settings as widely divergent as Nicaragua, Cambodia, and Pakistan document narratives of abuse that sound strikingly similar to those offered by battered women in North America and Europe (Hassan 1995; Zimmerman 1995; Ellsberg, Peña et al. 2000). They are characterized by multiple overlapping types of abuse—physical, sexual, emotional—accompanied by intimidation and control. But what of other forms of violence in intimate relationships? Do middle and low-income countries also have multiple variants of behavior captured by the single rubric of partner violence? Does wife beating as chastisement have different antecedents and determinants than more severe forms of abuse? And to what extent do the distinctions emerging in the North American literature have relevance in other settings? These are questions yet to be explored.

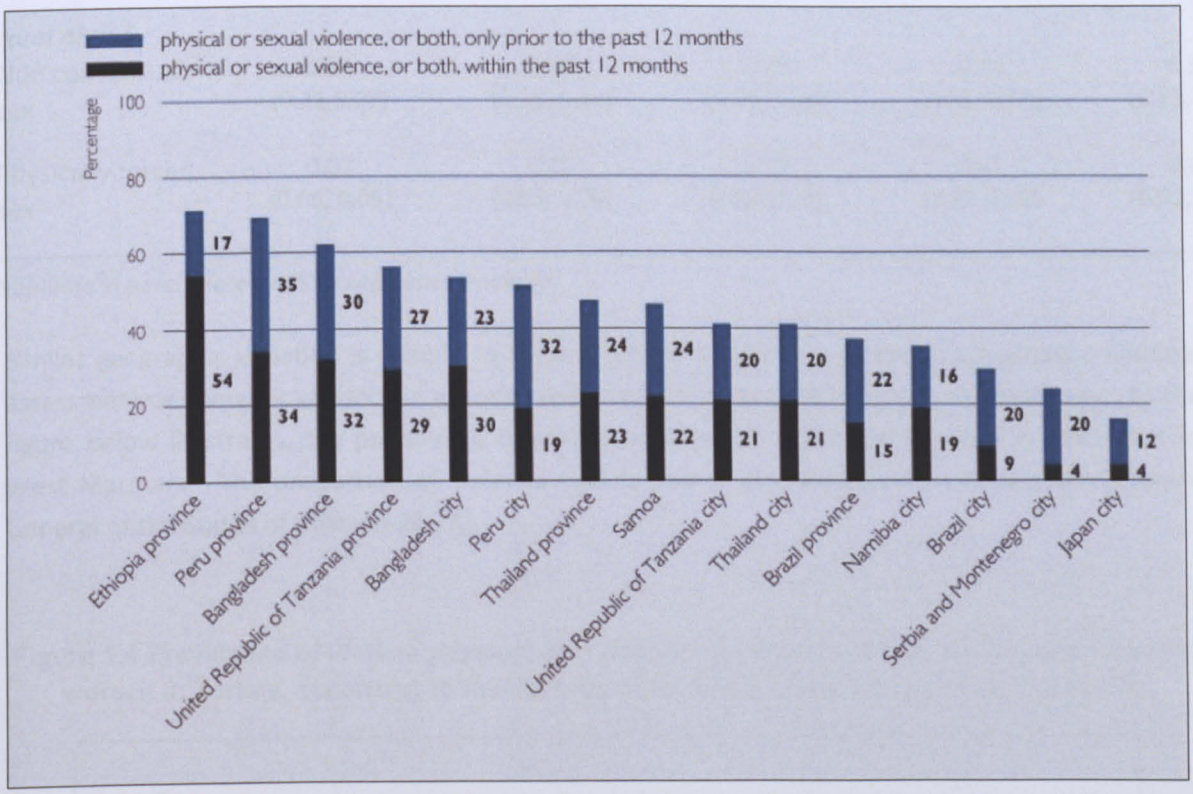
1.6 Prevalence and distribution of partner violence

Notwithstanding the above definitional issues, existing data suggest a wide variation in the levels of partner violence both between and within countries. Although the rhetoric of the women's movement has always emphasized that violence cuts across all races, cultures, and socioeconomic groups, the data suggest that it does so unevenly. Even accounting for methodologically induced variation, these differences are substantial. The proportion of women experiencing physical violence or rape from an intimate partner in the past 12 months ranges from less than 4.6%[6] of women in the United States (Black, Basile et al. 2011), 4% in Britain (Walby and Allen 2004), and 4% in Ireland (Watson and Parsons 2005) (using roughly similar methodologies) to more than half of all women in some developing country settings.

[6] The National Intimate Partner and Sexual Violence Survey 2010 indicates that 0.6 percent of women were raped by in intimate partner in the last 12 months and 4.0 were physically abused. The report does not allow one to estimate the overlap.

The WHO study, which used the same instrument and standardized interviewer training to maximize comparability among measure of abuse, found that the 12 month prevalence of physical and/or sexual abuse from an intimate partner varied from 3.7% of women in Serbia and Montenegro and 3.8% of women in Yokohama Japan, to 34.3% of women in Cuzco province in Peru and 53.7% of women in rural Ethiopia (World Health Organization 2005). See Figure 1.3.

Figure 1.3 Prevalence of physical or sexual violence, or both, by an intimate partner among ever-partnered women, according to when the violence took place, by site



Even within geographically close settings, the levels of abuse can vary quite dramatically across districts or even between villages. For example, within the North Indian state of Uttar Pradesh, the percentage of married men reporting physical abuse of their wives varied from 18% in some districts to 45% in others, with similar variations found in reports of nonconsensual sex and physically forced sex (Martin, Moracco et al. 2002) (see Table 1.2).

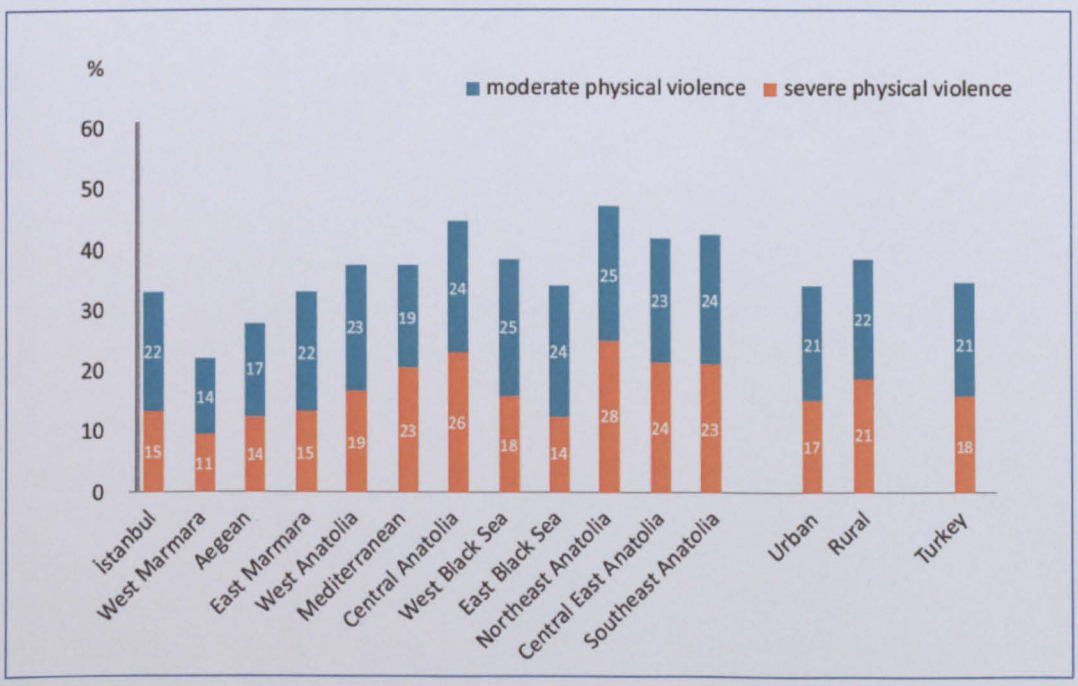
Table 1.2 District-specific estimates of the prevalence of wife abuse according to the reports of 6,695 married men surveyed in five geographic districts of the state of Uttar Pradesh, India, 1995-1996

Abuse type	Aligarh	Bandha	Gonda	Kanpur Nagar	Nainital
Physical abuse	0.28 (0.25,0.31)*	0.45 (0.41,0.49)	0.31 (0.28,0.35)	0.21 (0.18,0.24)	0.18 (0.13,0.23)
Sexual abuse					
Non consensual sex	0.24 (0.21,0.27)	0.40 (0.36, 0.44)	0.26 (0.23,0.29)	0.28 (0.25, 0.30)	0.18 (0.13, 0.23)
Physically forced sex	0.07 (0.05, 0.09)	0.07 (0.05, 0.09)	0.09 (0.07,0.12)	0.04 (0.02, 0.05)	0.04 (0.02, 0.06)

* Numbers in parentheses = 95% confidence intervals.

Similar geographic variation is evident in Turkey, where researchers recently completed a national assessment of domestic violence in a study replicating the original WHO study methodology. As the figure below illustrates, the prevalence of partner violence in Northeast Anatolia is twice that in West Marmara. The proportion of violence that is severe also varies across setting (Directorate General of the Status of Women 2010)].

Figure 1.4 Prevalence of lifetime physical violence by an intimate partner among ever-married women in Turkey, according to the severity of violence, place of residence and region



Data such as these raise the provocative question, how best can one understand the vast differences in risk of violence between individual women and between different geographic locations? Are the factors that predict distribution of violence between settings (causes of susceptibility) different than those that predict relative risk between individual women (causes of incidence) (Rose 1985)?

Answering such questions could help identify a set of factors that might be modifiable at a population level or useful for intervening with couples at high risk of abuse. The next chapter examines what we currently know about risk and protective factors for partner violence and traces the evolution of theory building around the causes of abuse.

Chapter 2: Explanatory Theories and Determinants of Partner Violence

Two key objectives of this thesis are to identify factors that change the risk of partner violence among individual women and to explore factors that may help explain the geographic distribution of partner violence between and within settings. Both aspects are potentially critical to identifying aspects of the social and individual environment that could be modified to reduce the future prevalence of partner violence.

This chapter explores two bodies of work that are fundamental to building and interpreting explanatory models of partner violence: 1) the various theories that have been put forth to explain partner violence; and 2) the factors that have emerged from the existing literature as associated with the odds of partner violence.

2.1 Evolution in explanatory paradigms of partner violence

As Einstein purportedly observed, "Our scientific view of the universe should be as simple as possible but not more simple than that (Marmont 2000)." The same could be said for theories guiding violence research. Regrettably, the early years of the field were dominated by single-factor theories and paradigms that were not adequate for explaining such a complex social phenomenon.

Theory-building around partner violence has been hampered by the strong disciplinary boundaries of the academic communities that have engaged the issue. The question of partner violence has been viewed through the lens of criminology, evolutionary biology, sociology, psychiatry, social psychology, marital therapy, deviance studies, developmental psychology, economics and feminist theory. Because these communities work from such different theoretical perspectives, it has been difficult to build toward a unified understanding of abuse. Much of the research that emerges from economics, developmental psychology, or biology, for example, remains completely unknown to those researching or responding to partner violence today.

Given this enormous expanse, it would be impossible in a single literature review to summarize all the theories that have been advanced to understand partner violence. In addition to the social science and health-related theories that I address below, there is a rapidly expanding literature from the biological sciences on the how genes, hormones and brain chemistry interact with environmental and developmental factors to affect aggression. Perhaps most interesting are findings that genetics appear to play a contributing role in determining which children maltreated in childhood are likely to go on to become depressed or violent and aggressive in adolescence, and which will be resilient and avoid long-term consequences (Caspi, McClay et al. 2002; Reif, Rösler et al. 2007 {Foley, 2004 #2601; Beach, Brody et al. 2010)(Foley, Eaves et al. 2004) . Given my emphasis on generating knowledge to inform prevention, I have chosen to focus only on factors that can be modified. Therefore, I exclude research and theories related to the role that neurochemistry,

genetics, personality features, or evolutionary biology might play in determining an individual's overall risk of perpetrating partner violence.

2.1.1 Theory building—The early years

The very earliest research on domestic violence was highly focused on the individual and sought explanations for the "strange" and destructive behavior of battered women and their partners either in biology or distortions of human personality, such as sadism, masochism, or pathological dependency (Snell, Rosenwald et al. 1964; Faulk 1974; Pizzey 1974; Gordon 2002). During this era, there was a tendency to generalize insights from small, select populations (e.g. incarcerated men or women in shelters) to the wider phenomena of partner violence. In keeping with their views on causality, early researchers and clinicians recommended psychiatric treatment for victims and treatment or incarceration for perpetrators as the most appropriate response to partner violence.

Contributions from sociology. Sociologists first turned their attention to domestic violence in the 1970s, when they began to apply sociological theories developed from other contexts to the challenge of understanding violence in the family. In 1971, for example, Goode applied "resource theory"—a perspective first advanced by Blood and Wolfe in the 1960s—to the special question of partner violence. Resource theory argues that decision-making power in relationships depends in large part on the value of the resources that each individual brings to the relationship. Resources may be either material (such as income, dowry, or contribution to family subsistence) or organizational (such as the power coming from kin networks, political alliances, and so forth). The balance of power in a relationship is influenced by each partner's relative command over economic, symbolic, and other resources (O'Brien 1971; Allen and Straus 1980). Using hundreds of interviews with white, middle-class wives in Detroit Michigan, for example, Blood and Wolfe demonstrated that men's perceived power in the family was a function of their access to income, occupational prestige, and educational attainment (Blood and Wolfe 1960).

Applying resource theory to family relations, Goode suggested that the more resources that men control outside of the family, the less likely they will need to use violence within the family to maintain power and control. Goode conceptualized the family as a power system, predicting that men with fewer resources would be more likely to use violence than men who had more resources. Resource theory also predicted that men facing economic crises, unemployment, or other types of material stressors might be particularly vulnerable to perpetrating abuse, as they seek to compensate for their resulting loss in status (Goode 1971).

Resource theory was revised in the 1980s following research in the United States and crosscultural research on marital power. Rodman suggested that violence was more likely to occur in settings where power or status is inconsistent (high in one setting, low in another) or when norms governing status in the family are shifting (for example, during eras when women assume new roles)(Rodman 1972). This observation, which has come to be known status inconsistency theory, posits that stress and frustration develop when individuals feel powerful in one context but powerless in another. Status inconsistency theory suggest that wife beating may be high in settings where men's traditional power in the family has eroded while women's power has increased (Levinson 1989).

In the domestic violence field, researchers have applied status inconsistency theory to argue that women's risk of violence will be greater if there are large power discrepancies between husbands and wives with respect to age, education, or occupational prestige (Yick 2001). Inconsistencies in either direction are hypothesized to put women at increased risk: a woman with relatively little education compared to her husband may contribute to her powerlessness and low status, putting her at increased risk. On the other hand, substantially more education or income may threaten her husband's sense of authority, increasing the likelihood of marital discord. Marriages marked by equal status are theoretically less violent (Hoffman, Demo et al. 1994).

As a sociological theory, status inconsistency applies mostly to individuals who experience discrepancies in power or status in different contexts, not to power imbalances within a single relationship. Researchers testing status inconsistencies between intimate partners, are in fact testing a different sociological theory, known as relative resource rheory. Relative resource theory, which also evolved from earlier resource theories, emphasizes *asymmetries* in men's and women's access to economic and social resources (Macmillan and Gartner 1999)(McCloskey 1996). This theory predicts that women with higher "status" than their partner (e.g. more education, more income), will be at increased risk of abuse as men use force or psychological manipulation to reaffirm their dominant status.

The theory has been further refined by "gendered resource theorists", who argue that status inconsistency interacts with individual and cultural ideas about gender (Atkinson, Greenstein et al. 2005). A husband's gender ideology creates a lens through which he interprets the meaning of resource inconsistencies. Gendered resource theorists propose that women's higher status will not be associated with increased risk if the partner holds more egalitarian views that do not demand that he be both primary breadwinner and decision maker in the family. Results from research on partner violence in Canada and the United States has been consistent with the predictions of gendered resource theory (Macmillan and Gartner 1999; Atkinson, Greenstein et al. 2005).

A more recent variant on this theme are theorists who argue that men resort to violence as a compensatory strategy when circumstances prevent them from fulfilling their socially prescribed role as provider (Jewkes 2002; Mahalik, Aldarondo et al. 2005). These authors speak in terms of a "gender role stress" and argue that when economic or social conditions make men feel powerless, they exert power in the one realm where they still can: the family. Although articulated most recently by feminist scholars, this idea harkens back to the sociological theories advanced by Goode in the 1970s.

In addition to the various resource theories, early violence researchers also drew from another set of sociological insights known as Social Exchange Theory. Exchange Theory posits that all forms of social interaction are in effect exchanges between individuals and institutions. Social behavior is motivated primarily by the pursuit of rewards and the avoidance of punishment and other forms of cost (Cook 1991). Applying social exchange theory to family violence, Richard Gelles argued in 1983: "People hit and abuse other family members because they can (p.157)." Gelles maintained that men would resort to violence as long as the rewards of doing so outweigh the costs (Gelles 1983). A corollary of Exchange Theory is that the overall level of partner violence in a society is determined by the sanctions imposed on perpetrators and the degree of social support offered victims. It is this

theory, together with notions of general deterrence from criminology that underpins current strategies to tackle partner violence by criminalizing the behavior and prosecuting offenders.

Contributions from feminist theory. Feminist theory posits that it is power imbalances between men as a class and women as a class—institutionalized in social structures and reproduced in the patriarchal family—that cause and reproduce violence against women in intimate relationships. This theory, most fully explicated by Russell and Rebecca Dobash postulates that partner violence is the natural outgrowth of cultural and historical processes that grant social and economic power to men (Dobash and Dobash 1979). As this husband and wife research team observed in 1979:

> Men who assault their wives are actually living up to cultural prescriptions that are cherished in Western society—aggressiveness, male dominance, and female subordination—and they use physical force as a means to enforce that dominance (p.24).

Feminist theory predicts that the vast majority of partner violence will be perpetrated by men against their female partners, but that levels of partner violence will decline as societies achieve greater equity between men and women. Researchers drawing on this theory have focused on power and control in relationships, social norms condoning wife beating, and structural and economic forces that keep women trapped in abusive relationships. While few researchers today would argue that "patriarchy" alone is the cause of domestic violence, feminist theory helps maintain focus on the gendered nature of much violence in the private sphere. It also provides an overarching framework for understanding how seemingly disparate issues, such as early marriage, female genital cutting, trafficking in women, and partner violence, are related through the subordination of women and girls.

Contributions from social psychology. Another theory that has been imported to help explain partner violence is social learning theory—the idea that children learn and reproduce behaviors that they see modelled in the family and by society at large, such as through television or video games. Social Learning Theory, which was first advanced by Albert Bandura in 1977 and later applied to domestic violence by O'Leary (1988), maintains that children observe the consequences of behavior from significant others and learn which behaviors achieve desired results without drawing negative consequences (Bandura 1977; O'Leary 1988). To the extent that violence is an effective strategy and attracts no punishment, children incorporate it into their behavioral repertoire (Bandura 1977).

Social learning is also one of the foundational theories of the "intergenerational transmission of violence" thesis, which predicts that children who witness or experience violence in childhood will be at higher risk of repeating that behavior themselves in adulthood (Stith, Rosen et al. 2000).

2.1.2 Theory building—Later contributions

Beginning in the 1990s, hosts of new theoretical approaches were applied as theorists and practitioners from allied fields began to study partner violence from their own disciplinary perspectives. Some of the most influential of these emerged from the fields of developmental psychology and delinquency studies. Psychologists studying the dynamics of normal child development, for example, began to articulate what happens when children fail to get the loving care they need to develop into healthy adults. Some researchers began to apply insights from

attachment theory and other developmental arenas to the special challenge of forming healthy relationships in adulthood.

Contributions from psychology. Attachment theory, originally developed by psychologist John Bowlby, holds that early parent-child bonding is essential for the development of normal emotional processing, a sense of belonging, and a healthy sense of self in relation to others. Traumatic experiences in childhood—abuse, neglect, abandonment—may lead to insecure adult attachment styles and their corresponding disturbances in personality. Adults with insecure attachment styles—further subdivided as preoccupied, distancing, or anxious—can lead to hostility toward attachment figures (e.g. intimate partners), as well as dependency, a sense of entitlement and subsequent controlling behavior and violence (Dutton 1995). Researchers such as Donald Dutton maintain that exposure to violence and poor parenting in childhood can influence the likelihood of future violence both through modeling (social learning) and through negative impacts on a child's developing personality. In extreme cases, poor attachment can result in personality disorders—such a borderline personality—that are characteristic of at least one subset of abusive men (Dutton and Starzomski 1993).

Other psychologists and criminologists who studied the evolution of deviant behavior likewise began generating insights potentially relevant to partner violence. In the late 1990s and early 2000s, findings relevant to partner violence began to emerge from longitudinal studies that had been initiated in the 1970s to study the long-term consequences of child abuse and/or the developmental trajectory of delinquency, antisocial behavior, and youth violence. These studies, primarily from the United States and New Zealand, revealed substantial overlap between the development of delinquency and aggression in adolescents and the perpetration of violence in their intimate relationships (Moffit and Caspi 1999; Ehrensaft, Cohen et al. 2003). They suggested that many of the formative experiences in childhood that increased the risk of general antisocial behavior, such as growing up in a violent home or harsh and coercive punishment, were equally predictive of aggression in later romantic partnerships. Indeed, several leading developmental psychologists found that conduct disorder in childhood and early adolescence (characterized by poor school performance, disruptive and aggressive behavior, lying, etc.) was a stronger explanatory variable of partner violence perpetration in adulthood—among both men and women—than any other factor (Ehrensaft, Cohen et al. 2003). [See Chapter 3 for further detail].

Contributions from studies of crime and social disorganization. Beginning in the late 1990s, sociologists who were studying the neighborhood determinants of crime began to explore the distribution of violence in the private realm as well (Browning 2002). These scholars had largely focused on the role that concentrated disadvantage, residential instability, and ethnic heterogeneity[7] plays in eroding community solidarity and trust and undermining the community's ability to regulate local criminal activity (through informal social controls) (Sampson, Raudenbush et

[7] Social disorganization theory views ethnic and racial heterogeneity as a structural feature of communities that may impede trust and communication among residents.

al. 1997). Now they turned their attention to whether these same factors, which had proven predictive of rates of stranger and acquaintance crime, were also associated with partner violence.

Specifically, they asked whether key neighborhood-level social processes, such as collective efficacy, informal social control, and norms of nonintervention in relationship disputes, specifically influenced levels of partner violence and/or the ability to mobilize community support for victims. Among neighborhoods in Chicago, for example, Browning found that neighborhood structural factors (population, residential instability and ethnic heterogeneity) did not relate to the prevalence of severe partner violence (over and above individual factors). To the contrary, neighborhood-level measures of collective efficacy were negatively (and significantly) associated with levels of partner violence and with women's likelihood to disclose relationship violence to others, over and above individual and relationship factors that increase risk of violence. Nonintervention norms, on average, led to an increase in the likelihood of violence among women, highlighting the importance of neighborhood tolerance of partner violence and norms of family privacy to overall levels of partner violence. Browning's modeling also indicated a positive and significant interaction between nonintervention norms and community collective efficacy such that the protective effect of collective efficacy weakens as community tolerance of violence increases. This suggests that the regulatory impact of collective efficacy on partner violence is larger when intervention in intimate relationships is normatively sanctioned (Browning 2002).

Contributions from economics. In the late 1990s, even economists began to theorize about the determinants of partner violence as they looked to game theory and household bargaining models to predict when women might be at increased and decreased risk of abuse. Similar to some of the earlier sociological theories, economists conceptualized power in relationships as a function of the relative resources that individuals bring to a relationship. Violence is just one more "resource" that men can use to tip the balance of power and decision-making in the household to their advantage.

Economists conceptualize the household as a site of bargaining where men and women "negotiate" over division of resources and the direction of life projects. The more resources that an individual controls, the greater their bargaining power in exerting their will or dominating decision-making. A variety of different household bargaining models have been applied to domestic violence, including some that assume the family is fundamentally a site of conflict and others that assume the family is a site of cooperation (McElroy and Horney 1990; Lundberg and Pollak 1993; Pollak 1994).

Taking a step further, feminist economists have conceptualized the household as a site of "cooperative conflict" where men and women cooperate in joint projects such as child-rearing, and "bargain" to pursue their own independent interests on behalf of themselves, or in the case of many women, on behalf of themselves and their children (Sen 1990; Agarwal 1997). The power that a woman has relative to her husband is a function both of the resources that she can control and the gender ideologies, norms, and stereotypes that either empower or constrain her ability to use these resources (Agarwal 1997). To the extent that social norms legitimize male control of assets, undervalue women, or limit women's ability to engage economically, socially or politically outside of the home, these norms reinforce the gender division of labor and male power (Seguino 2007).

Women's power in the household also depends on the strength of her "fall back" position. In other words, women's ability to bargain successfully for access and control of resources or to exert

influence on the direction of joint family projects depends in part on the viability of her alternatives. Can she survive economically and socially outside of her relationship if she should choose to leave? Does her society grant women the legal rights to leave violent or otherwise unsuccessful relationships without sacrificing custody of her children or an equitable share of family assets? Economists rather coldly label this a woman's "threat point." If she can credibly threaten to leave, it strengthens her bargaining position in the household.

Applied to domestic violence, feminist economic theory suggests that an individual woman's risk of domestic violence would be influenced by her access and control over resources as well as her ability to leave a relationship that puts her at risk. At a macro-level, this theoretical orientation would predict that factors affecting women and men's relative control over resources would influence a country's level of partner violence, as would laws, norms, or economic structures that either facilitate or make it difficult for women to leave dangerous relationships (Panda and Agarwal 2005).

2.2 Moving beyond single factor theories

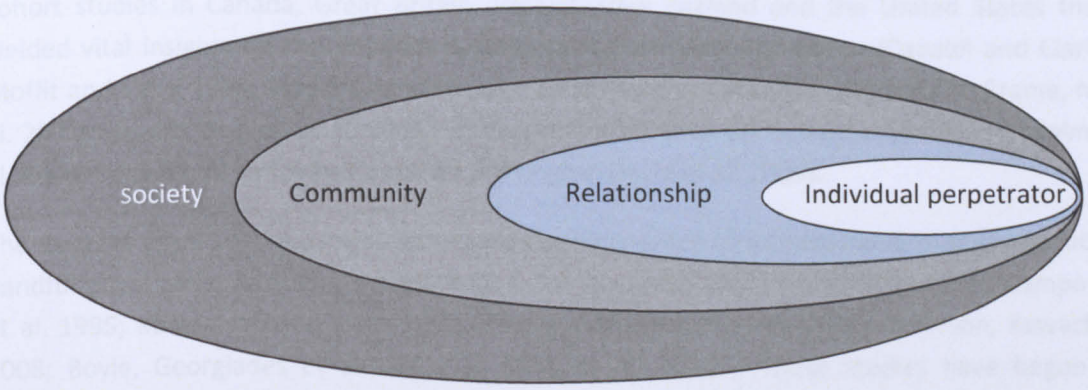
In the 1990s, several theorists began to argue for moving beyond single factor theories to recognize the complex nature of abuse. They maintained that abuse must be conceptualized as a multifaceted phenomenon grounded in the interplay among personal, situational, and socio-cultural factors. No one factor "causes" violence; rather, violence is more or less likely to occur as factors interact at different levels of the social ecology (Crowell and Burgess 1996).

This "nested ecological approach" built off of the insights and thinking of developmental psychologists (Brofenbrenner 1977) and the emerging field of social epidemiology (Krieger 2001). It was first applied to family violence by Belsky and Garbarino to organize the various research findings around child abuse and neglect (Garbarino and Crouter 1978; Belsky 1980). Later it was applied to partner violence by a variety of theorists, including Edleson and Tolman (Edleson and Tolman 1992), Corsi (Corsi 1994), Dutton (Dutton 1995) and Heise (Heise 1998).

Although first applied to child abuse over a decade earlier, the ecological framework had not widely filtered into the activist or research community when I published a journal article in 1998 urging its wider adoption as a means to accommodate both feminist and social science insights about partner violence (Heise 1998). Since then it has been adapted to guide studies of partner violence in a wide range of settings, including Bangladesh (Koenig, Ahmed et al. 2003), Mexico (Contreras Urbina 2005), Peru (Flake 2005), and South Africa, (Jewkes, Levin et al. 2002; Abrahams, Jewkes et al. 2004). In 2002, the World Health Organization also adopted the ecological framework as the basis for its program of work on interpersonal violence (Krug, Dahlberg et al. 2002).

As applied to abuse, ecological frameworks have been conceptualized in a variety of ways, though they all share the notion of embedded levels of causality. In my 1998 article, I used the framework as a heuristic tool for organizing the research that existed at that time into an intelligible whole. Figure 2.1, summarizes the model as originally published, along with the risk factors that I extracted from the social science and anthropological literature available at the time.

Figure 2.1 Original ecological model of factors associated with violence against women



- Norms granting men control over female behavior
- Acceptance of violence as a way to resolve conflict
- Notion of masculinity linked to dominance, honor, or aggression
- Rigid gender roles

- Poverty, low socio-economic status, unemployment
- Associating with delinquent peers
- Isolation of women and family

- Marital conflict
- Male control of wealth and decision-making in family

- Being male
- Witnessing marital violence as a child
- Absent or rejecting father
- Being abused as a child
- Alcohol use

Source: Heise, 1998

2.3 Evolution of risk factor research

When I first published the ecological model article in 1998, data on risk and protective factors for partner violence in low-income countries was still quite limited. I was forced to draw primarily on cross-sectional social science literature from North America, supplemented by a handful of quantitative studies from the developing world and research that drew insights from ecological and comparative analysis of ethnographic studies of small-scale societies [see for example: (Sanday 1981; Levinson 1989; Counts, Brown et al. 1992)].

Since that time there has been a burgeoning of research on the prevalence and determinants of abuse in both high and low-income countries. Probability-based sampling and multi-variable analysis have become the norm, with much greater attention being paid to measurement issues and the comparability of data across settings (Ellsberg and Heise 2005). Studies have gradually shifted from looking exclusively at explanatory variables of physical assault (an artifact of the CTS-1) to studying physical and/or sexual violence in relationships or sexual violence alone as an outcome.

The most recent decade has also witnessed the emergence of the first results from longitudinal birth cohort studies in Canada, Great Britain, Iceland, New Zealand and the United States that have yielded vital insights on the possible developmental correlates of abuse (Capaldi and Clark 1998; Moffit and Caspi 1999; Magdol, Moffitt et al. 1998; Swinford, DeMaris et al. 2000; Brame, Nagin et al. 2001; Capaldi, Dishion et al. 2001; Ehrensaft, Cohen et al. 2003; Gudlausdottir, Vilhajalmsson et al. 2004; Ireland and Smith 2009; Lussier, Farrington David et al. 2009).

The decades since 1995 have also witnessed the emergence of sophisticated, multilevel studies in a handful of countries, including Bangladesh, Colombia, India and the United States (O'Campo, Gielen et al. 1995; Koenig, Ahmed et al. 2003; Koenig, Stephenson et al. 2006; Ackerson, Kawachi et al. 2008; Boyle, Georgiades et al. 2009; Li, Kirby et al. 2010). These studies have begun to ask interesting questions about how factors interact between the individual and the community-level to influence women's risk of partner violence. Appendix B summarizes the primary findings from the 12 multilevel studies of partner violence currently available in the literature. I discuss these in greater depth at the end of this chapter.

The following sections summarize our current state of knowledge on factors associated with the risk of partner violence at both the individual and population level. The literature is organized by level—individual, relationship, community, and macro level. Except for a handful of prospective studies, the studies cited represent cross-sectional surveys of representative samples of women and/or men, with an emphasis on findings post 2000 from developing countries. In this review I draw heavily from our article, *"What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on women's health and domestic violence,"* located in Appendix A, that summarizes risk and protective factors for current physical and sexual partner violence (within the last 12 months) across the 15 sites of the WHO study. This article has the advantage of comparing risk factors across a range of settings using a standardized questionnaire and multiple strategies to enhance the comparability of the data, including extensive interviewer training and rigorous quality control standards (Garcia Moreno, Watts et al. 2003; Jansen, Watts et al. 2004).

The review also draws heavily from 2 reviews of DHS data: one a review of 9 surveys of physical or sexual partner violence among women 15 to 49 conducted between 1995 and 2000 (Kishor and Johnson 2004) and a second covering 10 surveys of partner violence conducted between 2000 and 2008 (Hindin, Kishor et al. 2008). The 2008 review includes currently married or cohabitating women ages 20 to 44 and their partners in Bangladesh, Bolivia, Dominican Republic, Haiti, Kenya, Malawi, Moldova, Rwanda, Zambia and Zimbabwe. Significantly, it analyzes data collected from *couples*, although each member of the dyad was interviewed separately and at a separate time. By contrast, the earlier 2004 review covered Cambodia, Colombia, Dominican Republic, Egypt, Haiti, India, Nicaragua, Peru, and Zambia and analyzed data collected only from women. Four of the studies (India, Egypt, Peru, and Zambia) used a single "threshold question" about whether the woman has ever been beaten or mistreated physically by a partner, rather than a series of questions about specific acts as is customary in CTS. This strategy has been shown to yield lower rates of disclosure (Ellsberg, Heise et al. 2001); it also limits responses to physical violence unless a woman chooses to consider forced sex a form of physical mistreatment.

The cross-sectional nature of the WHO and DHS data and most of the other studies cited makes it inappropriate to draw firm conclusions about causality from the associations documented. In Chapter 3, however, I review the findings available from longitudinal and birth cohort studies that provide enhanced information on the temporal ordering of factors as well as more exploration of the developmental trajectory of violence across the lifespan.

2.4 Risk factors for partner violence, with an emphasis on low and middle-income countries

2.4.1 Individual level factors

Sociodemographic factors. Interestingly, there are few individual sociodemographic factors that emerge as consistently associated with increased risk of perpetration or victimization across all settings. In multi-variable analysis, the WHO study found a strong association between young age and increased risk of *past year* physical or sexual partner victimization (IPV-WHO) in all sites (significant in 12 of 15 sites) after adjusting for a wide range of individual and relationship-related variables (see Appendix A)[8]. A similar pattern was seen in bi-variable analysis for partner's age but this variable was excluded from multi-variable models due to its strong correlation with the woman's age. The higher risk among young women may reflect a special vulnerability, or it could be that young women are more likely to partner with younger men who have a higher propensity for violence than older men (Walby and Allen 2004).[9]

The relationship between age and *lifetime* risk of partner violence is less clear. In the 2008 DHS review, older age was associated with higher lifetime risk of partner violence in 6 of 10 countries, but remained significant in only Rwanda, once partner and community-related factors are added to the model (Hindin, Kishor et al. 2008). Among 10 countries in North, Central, and South America, however, younger adults (18–24) were more likely than older adults to be both perpetrators and victims of partner violence (Graham, Bernards et al. 2008).

A recent systematic review of the relationship between partner violence and women and men's educational attainment found a generally protective effect of secondary education on women's risk of victimization and to a lesser extent on the risk of perpetration by men. The evidence for any protective effect of education at lower grade levels is less compelling (Vyas and Watts 2008). Similarly, Kishor's 2004 review of DHS surveys found that women with more education—especially those with secondary education or higher, appeared to be protected from physical violence,

[8] All models were adjusted for partnerships status, duration of relationship, dowry and/or brideprice exchange, partner violent with other men in the last 12 months, women subjected to physical or sexual violence by nonpartners since the age of 15. In addition, models were adjusted for the following factors for both the woman and her partner: history of abuse in childhood ; witnessing partner violence in childhood; educational attainment; household SES; women's age; age gap with partner; relative educational status; relative employment status; acceptance of wife abuse; heavy alcohol use; outside sexual relationships.

[9] The WHO study covered 15 sites in 10 countries including Bangladesh, Brazil, Ethiopia, Japan, Peru, Samoa, Serbia and Montenegro, Tanzania, and Thailand.

although the protection was not universal (Kishor and Johnson 2004). In the WHO study, if either the woman or her partner completed secondary education (or primary for Bangladesh, Ethiopia and Tanzania), the woman's risk of *past year* partner violence was lower in almost two thirds of the sites (3 of 14 significant for women and for their partners), when compared to situations where neither the woman nor her partner completed that level. Women had the lowest odds (10 of 14 sites significant), when both the woman *and* her partner had completed the schooling level (Garcia Moreno, Watts et al. 2003). In the 2008 review of DHS among 20 to 44 year old women, years of schooling was protective against lifetime violence in Bolivia, Kenya and Zimbabwe but a risk factor in Haiti (Hindin, Kishor et al. 2008). A recent study from India found that women with fewer years of education had a higher lifetime and recent (past 12 months) experience of partner violence than women having some post-secondary education (Ackerson, Kawachi et al. 2008). Overall, it appears that formal education reduces the risk of partner violence, but that the protective effect does not kick in until women or men complete secondary education.

Partnership status. Living with a partner without formal marriage appears to increase women's risk of violence in the vast majority of settings (Kishor and Johnson 2004) (Abramsky, Watts et al. 2011) (Flake 2005). It may be that married men are more invested in the relationship, or that marriage confers a status offering some protection from abuse. Alternatively, it could be that men prone to violence are less likely to get married, at least in some cultures. In Zimbabwe, for example, cohabitating women were nearly two and a half times more likely (aOR=2.49) to report violence than were married women (Ackerson, Kawachi et al. 2008). The lifetime risk of physical or sexual partner violence is also routinely higher among women who are divorced or separated, a finding that is consistent with the idea that violence is a common reason for marital dissolution (Kishor and Johnson 2004) (World Health Organization 2005) (Flake and Forste 2006). In some instances, it may also reflect the finding from longitudinal studies in the US and Canada that abused women separated, but not divorced from their partner, are at especially high risk of further abuse and spousal homicide (Campbell, Webster et al. 2003) (Koziol-McLain, Coates et al. 2001) (Johnson 2006).

Number of children. In most settings where it has been investigated, there is an association between the number of children that women have and their risk of physical partner violence (Avila-Burgos, Valdez-Santiago et al. 2009) (Ellsberg, Rena et al. 1999) (Olsen, Parra et al. 2010). In the 2004 DHS review, with the exception of Haiti and Zambia, the odds of women experiencing physical violence increased sharply as her number of children increased. This holds true for both current and lifetime violence in most settings (Kishor and Johnson 2004).

In a separate analysis of the Haiti DHS, Gage found that while number of children was not related to physical partner violence, there was a strong positive relationship between having many children and the risk of sexual violence in relationships. She suggests that in this setting, many children may be a consequence of living in a relationship where women's ability to control and negotiate the timing of sex or the use of contraception may be difficult (Gage 2005).

The association between number of children and risk of partner violence, however, may depend in part on local context. In Uganda, for example, the risk of current domestic violence was *lower* among women with six or more children (OR 0.41) (Koenig, Lutalo et al. 2003) whereas in a national

survey in Israel there was no association between number of children and partner violence (Eisikovits, Winstok et al. 2004). In Bangladesh and India, studies demonstrate a *decreasing* risk of violence with an increase in the number of living sons, a finding that is consistent with these countries' strong cultural bias toward male children (Schuler, Hashemi et al. 1996; Rao 1997), but see Koenig for a Bangladeshi exception that finds no association between risk of violence and number of living sons (Koenig, Ahmed et al. 2003).

Women's economic independence and employment. In cross-sectional studies, the effect of women's employment and access to independent income on the risk of partner violence is highly inconsistent. A systematic review of 22 studies conducted in low- and middle-income countries between 1992 and 2005 found that women's access to cash employment was protective against violence in some studies and settings but increased women's risk of violence in others (Vyas and Watts 2008). Studies from rural and urban settings in India and Bangladesh, for example, have generally found that women's participation in employment is associated, both before and after marriage, with greater reporting of domestic violence (Krishnan 2005; Krishnan, Rocca et al. 2010) (Rocca, Rathod et al. 2009) (Verma and Collumbien 2003; Kishor and Johnson 2004) (Rahman, Hoque et al. 2011). By contrast, a study in the southern state of Kerala found that women who had regular wage employment were less likely to be beaten than unemployed women (Panda and Agarwal 2005).

In Kishor's 2004 review of physical partner violence, earning a cash income was associated with significantly lower lifetime risk of physical partner violence in Egypt, but with higher physical violence in Colombia, Dominican Republic, India Nicaragua, Peru and rural Bangladesh (Kishor and Johnson 2004) (Naved and Persson, 2005). It was not significantly associated with physical violence in Haiti (Kishor and Johnson, 2004) or urban Bangladesh (Naved and Persson, 2005) or with physical and/or sexual violence in Zambia or Cambodia (Kishor and Johnson, 2004). In Bolivia, the Dominican Republic and Zimbabwe, women who were not working at all had a lower risk of partner violence than women working in nonagricultural occupations (Kishor and Johnson 2004).

The only prospective study available from the developing world on the impact of female employment on partner violence comes from a slum community in Bangalore. This study found that women who were unemployed at time one and became employed during the study period faced 80% higher odds of violence compared with women who maintained the same employment status (Krishnan, Rocca et al. 2010). Equally important to women's risk was their husband's employment stability. Women whose husbands were employed at the beginning of the study but then lost their job or faced job-related difficulties had 1.7 times the odds of being physically abused during the study than women whose husbands' employment status remained stable (Krishnan, Rocca et al. 2010).

Indeed, an expanding body of research suggests that the effect of economic variables on women's risk of violence may depend in part on the relative economic position of her partner and on cultural expectations regarding male and female gender roles. In the WHO study, for example, women who worked for cash when their partners did not were at increased risk of violence in 6 of 14 settings. Couples in which only the man worked appeared to be at slightly lower risk of violence in 8 of 14 sites compared to couples in which both partners worked (the finding reached statistical significance

in only 2 sites, however, probably due to limited sample size). A study of partner violence in the United States likewise found that when husbands held traditional gender ideologies, women who earned more than their partners were at increased risk of violence, whereas relative earnings had no effect on the likelihood of violence within couples where the man had more egalitarian gender expectations. The authors suggest that when men accept an ideology that defines masculinity in terms of being the breadwinner, and their wives earn a significant portion of couple income, violence might be used to compensate for the symbolic loss of male superiority (Macmillan and Gartner 1999).

Exposure to violence as a child. Studies from a wide range of industrial and developing country settings have found that children who either experience violence themselves or witness violence between their parents are more likely to use violence in their relationships as adults (Ellsberg, Peña et al. 1999; Jewkes, Levin et al. 2002; Martin, Moracco et al. 2002; Kishor and Johnson 2004; Abrahams and Jewkes 2005; Contreras Urbina 2005; Flake 2005; Gage 2005).

In her survey of male municipal workers in Cape Town South Africa, for example, Abrahams found that witnessing one's mother being beaten increased a range of men's violent behaviors in adulthood, including use of physical violence in the workplace, the community, against one's partner, and arrest for possession of illegal firearms. This relationship persisted after controlling for sociodemographic variables, and experiencing frequent physical punishment as a child. In the adjusted model, the aOR for using physical violence against one's partner was 2.69; (95% CI 2.00, 3.62) and the population attributable fraction was 27% (Abrahams and Jewkes 2005). Likewise, in the WHO study, male partners who witnessed their own mother being beaten were at significantly higher risk of perpetrating abuse in 10 of the 15 sites studied. Even in those settings where the numbers did not reach significance, the effect, adjusted for confounders, was toward increased risk in all settings except urban Thailand (Abramsky, Watts et al. 2011).

Exposure to violence in childhood also appears to increase women's risk of victimization. In her 2004 review of DHS surveys, Kishor reports that women whose mothers were beaten were much more likely to experience physical violence in their relationships than those whose mothers were not beaten, despite controls for other variables. The odds ratios for ever experiencing partner violence ranged from aOR = 1.61 in Nicaragua to aOR = 2.26 in Cambodia (Kishor and Johnson 2004). The WHO study found likewise, with the association between experiencing partner violence and seeing your mother abused ranging from aOR 1.4 in urban Thailand to aOR 3.4 in urban Bangladesh. The association was positive in all cases and significant in 10 of 15 sites (Abramsky, Watts et al. 2011).

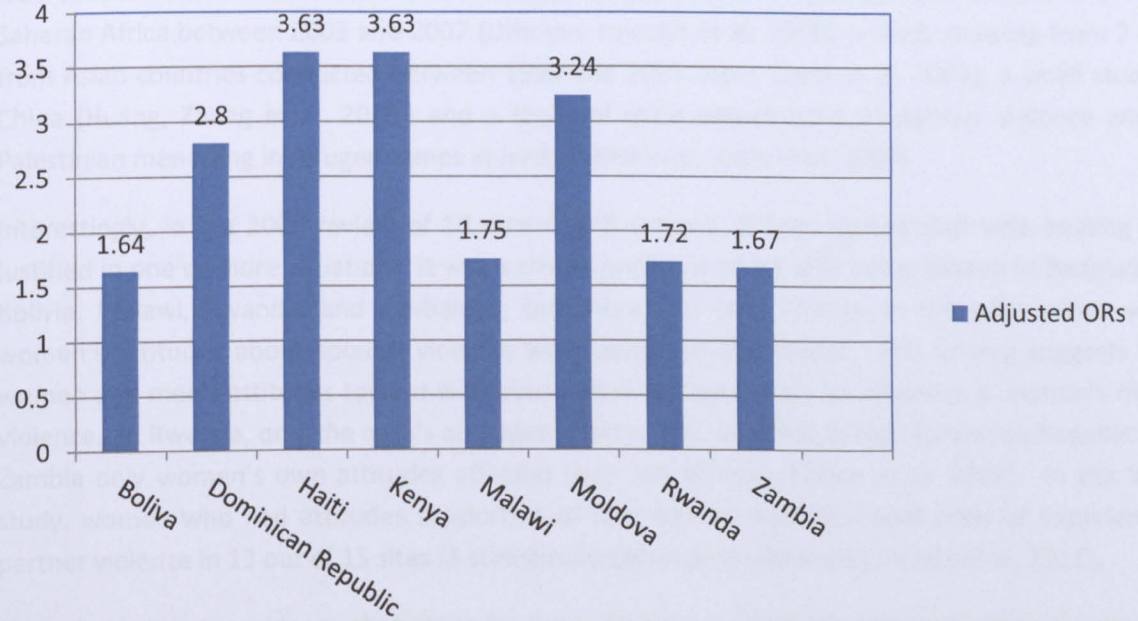
A few studies have also suggested that being sexually abused in childhood specifically increases women's risk of partner violence in adulthood (Briere and Runtz 1987; Kemp, Rawlings et al. 1991; Dutton, Burghardt et al. 1994; Coid, Petruckevitch et al. 2001). In a study of women attending primary care facilities in East London, unwanted sexual intercourse in childhood (<16 years of age) increased the odds of experiencing domestic violence in adulthood more than three-fold, after adjusting for potential confounders (aOR = 3.54; 95% CI 1.52-8.25 (Coid, Petruckevitch et al. 2001).

The exact mechanisms that translate witnessing or experiencing violence in childhood into violent and abusive behavior in adulthood is yet unclear. Many theorists emphasize that growing up in a

violent home "teaches" children to be violent or to tolerate abuse through behavioral modeling (O'Leary 1988). However, it is also likely that early victimization leaves emotional and developmental scars that can damage a child's developing sense of self. Research by Dutton (1995), for example suggests that early experiences in the family of origin influence not only behavior (through observation) but also a child's developing personality (Dutton 1995). Research shows that many of the personality features that are characteristic of at least one subtype of perpetrator are highly reminiscent of personality disturbances that derive from trauma: exaggerated separation anxiety, problems with regulating emotion, an intense dependency on primary interpersonal relationships, and an inability to tolerate being alone. Dutton hypothesizes that in addition to teaching violence, abusive homes can lead to psychological disturbances that, in combination with other micro-, community, and macro-level influences, can lead to violence and aggression in later life (Dutton 1995).

Alcohol abuse. Among individual-level factors, excessive drinking has emerged as an especially powerful risk factor for partner violence perpetration by men. Population-based surveys from Cambodia, Colombia, Dominican Republic, Haiti, India, Nicaragua, Peru, and Zambia, among others, uniformly suggest that a woman's odds of experiencing violence go up dramatically if her partner abuses alcohol (Kishor and Johnson 2004). Indeed, the association between men's consumption of any alcohol and women's reports of abuse, remain strong even after adjusting for a large range of women's characteristics, partner characteristics, household factors, differences between partners in age and education, and community-level factors (see Figure 2.2)

Figure 2.2 Current partner violence among currently married/cohabiting women age 20-44 whose husbands/partners consume alcohol relative to those who husbands/partners do not consume alcohol (couples subsample)



Note: Adjusted for woman and partner's age, education, employment status, age at first marriage, and attitudes toward wife beating as well as partnership status, age different between partners, educational differences between partners, household decisionmaking on health and purchasing large items and for average years of male and female education in the community and community attitudes toward wife beating (Hindin, Kishor et al. 2008).

Likewise, in the WHO study, odds of partner violence were higher in relationships where one or both partners had problems with alcohol, compared to relationships where neither of the partners drank (he has drinking problem 14 of 14 studies, 12 significant; she has a drinking problem 10 of 11 studies, 5 significant; both have drinking problems 11 of 11 studies, 7 significant) (Abramsky, Watts et al. 2011). A ten country study on alcohol use and partner violence in Latin America further found that violence toward female partners was especially associated more with binge drinking, suggesting that it is the quantity of alcohol consumed per occasion not just whether the person is a drinker that accounts for the relationship between partner drinking and partner violence (Graham and Bernards 2008).

The specific role that alcohol plays in the etiology of partner violence has been hotly contested (Johnson 2001; Leonard 2005; Gil-Gonzalez, Vives-Cases et al. 2006). There has been reluctance on the part of many advocates and researchers to acknowledge that alcohol may play a role in the dynamics of relationship abuse, for fear that alcohol would be used to excuse men's violent behavior. Nonetheless, there is a growing body of laboratory, clinical and epidemiological research that suggests that alcohol both facilitates episodes of abuse and increases the likelihood of injury, by reducing inhibitions and distorting cognitive perceptions (Leonard 2005).

Attitudes supportive of violence. Acceptability of partner violence varies greatly by setting, both within and between countries. Women and men appear to make finely grained distinctions regarding reasons justifying wife beating, with individuals accepting some reasons and rejecting

others among a list of possible circumstances where abuse might be justified. In most settings, attitudes condoning partner violence on the part of both women and men are highly predictive of rates of perpetration—an observation confirmed by a study of physical partner aggression in 8-metropolitan areas of Latin American and Spain (Orpinas, 1997); national level studies in 17 sub-Saharan Africa between 2003 and 2007 (Uthman, Lawoko et al. 2009); a study drawing from 7 DHS from Asian countries conducted between 1999 and 2001 (Rani, Bonu et al. 2004); a small study in China (Huang, Zhang et al. 2010); and a study of male perpetrators of partner violence among Palestinian men living in refugee camps in Jordan (Khawaja, Linos et al. 2008).

Interestingly, in the 2008 review of 10 recent DHS surveys, if men agreed that wife beating was justified in one or more situations, it was a strong predictor of his wife being beaten in Bangladesh, Bolivia, Malawi, Rwanda, and Zimbabwe; but there was little change in the odds ratios when women's attitudes about spousal violence were added to the model. This finding suggests that women and men's attitudes toward wife abuse work independently to influence a woman's risk of violence. In Rwanda, only the men's attitudes affected risk, whereas in the Dominican Republic and Zambia only women's own attitudes affected their risk (Hindin, Kishor et al. 2008). In the WHO study, women who had attitudes supportive of wife beating had increased odds of experiencing partner violence in 13 out of 15 sites (8 statistically significant) (Abramsky, Watts et al. 2011).

There is also some evidence that attitudes may serve to mediate the effect of other variables on later partner violence. For example, attitudes supportive of wife beating among Chinese men partly mediated the effect of exposure to violence in childhood and adult partner violence over and above socio demographic factors and marital dissatisfaction (Jin, Eagle et al. 2007). Likewise in a random sample of 362 married Arab men in Israel a series of higher order variables related to male dominance and patriarchal ideology significantly predicted attitudes accepting of wife beating, over and above age and educational level (Haj-Yahia 2003). The author carefully adapted to the Arab context existing scales of patriarchal versus equalitarian attitudes toward women, marriage role expectations, sex role stereotyping, religiosity, male patriarchal beliefs, attitude toward wife beating, and social desirability bias and demonstrated that 50.8% of the variance in Arab men's tendency to justify wife beating could be accounted for by these variables, together with age and education. This study also revealed that all of the six main patriarchal-ideology-based variables were highly correlated. The more Arab men justified wife beating, the more they blamed the wife for violence against her ($r=0.823$, $p<0.0001$) and the less they tended to hold violent husbands responsible for their behavior ($r=-0.800$, $p<0.0001$).

Controlling behavior. Consistently across settings, men who are physically violent toward their partners also exhibit higher levels of controlling behaviors (Ellsberg, Peña et al. 2000; Dunkle, Jewkes et al. 2004; Kishor and Johnson 2004; World Health Organization 2005). Most studies measure a range of behaviors that limit women's mobility and freedom, including whether the partner commonly attempts to restrict a woman's contact with her family or friends, whether he insists on knowing where she is at all times, and whether he constantly accuses her of infidelity. There is some question as to whether controlling behavior is best conceptualized as a risk factor for partner violence or whether it is part of the constituent phenomena (see discussion in section 5.3.6). In their study of women and HIV risk in South Africa, Dunkle and colleagues argue that the lack of confounding or statistical interaction between partner violence and their measure of controlling

behavior (the relationship control sub-scale of the Sexual Relationship Power Scale), suggests that the measures tap into different and equally important underlying constructs. They found that both measures predicted incident HIV infection, even after controlling for age, current relationship status, and women's sexual risk behavior (Dunkle, Jewkes et al. 2004).

2.4.2 Relationship/household factors

Household SES. A common assumption in the literature is that economic disadvantage at a household level will increase the risk of partner violence. The logic here is that the burdens of poverty may increase relationship discord, or generate stress, frustration and a sense of inadequacy in some men because of their inability to live up to their culturally defined role of provider (Heise 1998; Martin, Tsui et al. 1999; Jewkes 2002).

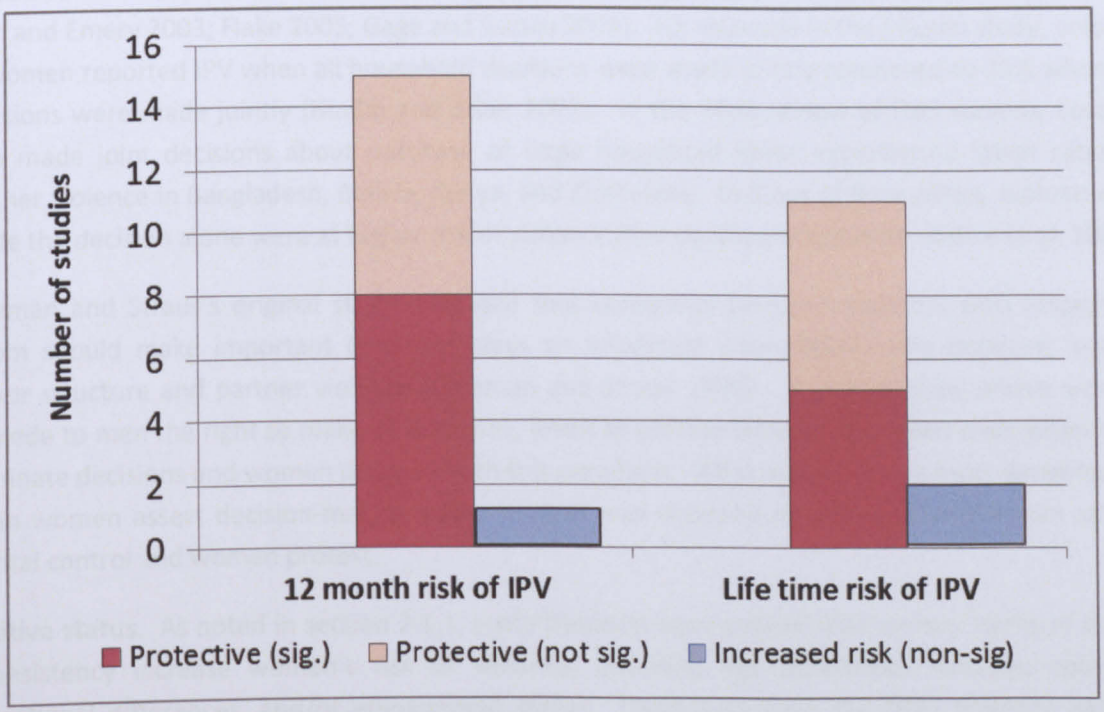
A critical look at the empirical literature, however, suggests that the relationship between partner violence and poverty measured at a household level is more complex (Vyas and Watts 2008). There are indeed a large number of studies from both the industrial and developing world that suggest a positive association between household disadvantage and the risk of partner violence (Hoffman, Demo et al. 1994; Rodgers 1994; Ellsberg, Peña et al. 1999; Koenig, Hossain et al. 1999; Martin, Tsui et al. 1999; Hindin and Adair 2002; Bates, Schuler et al. ; Walby and Allen 2004; Yount and Carrera 2006; Luke and al. 2007); however, other studies show no effect (Contreras Urbina 2005; Flake 2005; Gage and Suzuki 2005; Naved and Persson 2005).

Making sense of the literature is complicated by the fact that studies have used non comparable methods for defining economic position, including household income (Kim and Cho 1992; Walby and Allen 2004), various household wealth measures based on assets (Martin, Tsui et al. 1999; Diop-Sidibe, Campbell et al. 2005; Gage and Suzuki 2005; Koenig, Stephenson et al. 2006), and indices that combine into one metric, household income, educational attainment, and other measures such as occupational prestige, sanitary conditions, or employment status of the household head (e.g.(Hoffman, Demo et al. 1994; Ellsberg, Peña et al. 1999; Contreras Urbina 2005).

A clearer test of the association between risk of violence and the poverty-wealth status of households is provided by Hindin and colleagues who use a well-tested asset index to explore this relationship across a range of DHS surveys. The DHS wealth index is constructed using household asset data and principle components analysis, using a technique that has been developed and extensively tested across a full complement of DHS surveys (Gwatkin, Rutstein et al. 2000; Vyas and Kumaranayake 2006). Using this measure, Hindin found no consistent relationship between the risk of partner violence and the poverty wealth status of the household among currently married or cohabitating couples, after controlling for individual, relationship and community-level variables. In Bolivia, Moldova and Zimbabwe, women living in the richest households were significantly less likely to report partner violence whereas in Haiti, they were more likely to report partner violence (Hindin, Kishor et al. 2008). In the other five countries, there was no significant relationship between wealth status and partner violence. By contrast, among countries in the WHO study, using a similar asset index, higher socioeconomic position was associated with decreased *current* partner violence in 14 of 15 sites (significantly so in 8 sites when comparing the highest SES group to the lowest) (Abramsky, Watts et al. 2011).

Figure 2.3 provides a visual summary of the strength of the evidence, based on a systematic review of 34 studies from low and middle-income countries that examined the association between household wealth and risk of domestic violence, using various asset-based wealth measures (Vyas and Watts 2008). In this review, there were only three studies where higher asset wealth increased risk of partner violence, although the positive associations found failed to reach statistical significance. A comparison of graphs A and B below (comparing the number of studies showing a protective association between asset wealth and partner violence for lifetime versus 12 month violence), suggests the evidence for protection is stronger for protection against current partner violence (Vyas and Watts 2008).

Figure 2.3 Number of studies documenting either reduced or increased risk of lifetime or 12 month partner violence by household asset wealth



Source: (Vyas and Watts 2008).

Marital conflict. Not surprisingly, nonviolent marital conflict emerges repeatedly in the literature as highly predictive of partner violence, even after controlling for other variables (Coleman and Straus 1990; Hoffman, Demo et al. 1994; Jewkes, Levin et al. 2002; Kim and Emery 2003; Abrahams and Jewkes 2005). In their population-based study of Thai men, for example, Hoffman, Demo and Edwards demonstrated that verbal marital conflict remained significantly related to physical wife assault, even after controlling for socioeconomic status, husband's stress, and other family process variables (e.g. marital companionship and marital instability)(Hoffman, Demo et al. 1994). In a systematic review of this literature, Vives-Cases and colleagues conclude that despite methodological limitations, existing studies support an independent association between marital conflict and partner violence, with 10 of 11 studies finding a significant correlation in multi-variable analysis (Vives-Cases and Gil-Gonzalea 2009).

It is not clear, however, whether it is appropriate to consider all instances of partner violence in the developing world as arising from "conflict" per se. Women report a remarkably consistent set of triggers for instances of partner violence, including female disobedience, questioning the man about money or girlfriends, issues around sex or suspected infidelity, arguments over drinking or gambling, challenges to male authority, and issues around children or in-laws (Krug, Dahlberg et al. 2002). While some of these are clearly a source of marital argument, wife beating in many settings is frequently conceptualized as male "correction" of female behavior (Krug, Dahlberg et al. 2002; Salway, Jesmin et al. 2005). Wife beating in this schema is a form of "discipline" rather than arguments between two equal partners.

Marital power. Egalitarian relationships where men and women play equal roles in decision-making appear to have the lowest rates of relationship conflict and the lowest levels of partner violence. Coleman and Straus found this in their original sample of US couples (Coleman and Straus 1990) and it has been confirmed in similar studies undertaken in Haiti, Peru, the Philippines, and South Korea (Kim and Emery 2003; Flake 2005; Gage and Suzuki 2005). For example in the Filipino study, only 6% of women reported IPV when all household decisions were made jointly compared to 25% when no decisions were made jointly (Hindin and Adair 2002). In the 2008 review of DHS surveys, couples who made joint decisions about purchase of large household items experienced lower rates of partner violence in Bangladesh, Bolivia, Kenya, and Zimbabwe. In 8 out of 9 countries, women who made the decision alone were at higher risk of violence (five significantly)(Hindin, Kishor et al. 2008).

Coleman and Straus's original study indicated that consensus between partners with respect to whom should make important decisions plays an important intermediary role between marital power structure and partner violence (Coleman and Straus 1990). In partnerships where women concede to men the right to make all decisions, levels of partner violence are lower than when men dominate decisions and women disagree with this paradigm. What appears to be most dangerous is when women assert decision-making authority and men disagree or where men maintain strong marital control and women protest.

Relative status. As noted in section 2.1.1, some theorists have posited that various forms of status inconsistency increase women's risk of violence, including age differences between spouses, educational differences, and/or employment status. Using data from the 1993 Violence against Women Survey in Canada, for example, Macmillan and Gartner demonstrate that women's labor force participation lowers risks of spousal abuse when male partners are also employed but substantially increases risks when not. They argue that employment in this context is a "symbolic" resource in relationships. "The primary significance of employment for spousal violence," they observe "is as a measure of the relative statuses of husbands and wives within a relationship structured by gendered expectations of male authority and female dependence" (Macmillan and Gartner 1999).

A similar pattern emerged in a subset of the WHO sites. Women who worked for cash when their partners did not were at increased risk of violence in six of 14 settings (2 significant). Couples where only the man worked appeared to be at slightly lower risk of partner violence than couples where both partners worked (8 of 14 studies, two significant) (Abramsky, Watts et al. 2011).

In the 2008 review of DHS surveys, there was a lower risk of physical or sexual violence for women whose husbands were at least 5 years older than them, compared to women older than their partner or closer to his age. In none of the other countries, however, did partner violence risk vary significantly with the age difference between couples (Hindin, Kishor et al. 2008). Likewise, in the WHO study, the association between partner violence and age-gap between partners was weak or nonexistent in most settings, and the direction of the effect varied by context (Abramsky, Watts et al. 2011).

In the WHO study, there was some suggestion that inequality in educational level between a woman and her partner may increase her risk of experiencing partner violence. This was true in 9 of the 15 sites where the woman had the higher level of education, but only one of these associations reached statistical significance. Moreover, associations tended to be weak and some were observed in the opposite direction (Abramsky, Watts et al. 2011).

2.4.3 Community-level factors

In recent years, there has been increasing interest in potential community-level effects on a woman's risk of domestic violence. A number of studies have suggested that living in a disadvantaged or poor community appears to increase women's risk of abuse, over and above any individual-level factors (O'Campo, Gielen et al. 1995; Miles-Doan 1998; Gage 2005); (Cunradi, Caetano et al. 2000); (Pearlman, Zierler et al. 2003); (Van Wyk 2003).

O'Campo and colleagues, for example, found that among pregnant women in Baltimore, those residing in census tracts in the lowest quartile of per capita income were four times more likely to report partner violence than those residing in census tracts in the highest quartile of per capita income, even after controlling for other variables including individual income. The study documents a similar relationship for women residing in neighborhoods of high versus low unemployment. Gage (2005) likewise found using multilevel analysis that women living in impoverished neighborhoods in Haiti (measured by household poverty and male joblessness) had two-fold higher odds of experiencing sexual violence by a partner in the past 12 months compared to women living in better off neighborhoods (Gage 2005).

Certain individuals may be more sensitive than others to the contextual environment. A study by Cunradi and colleagues, based on 1995 data from the National Alcohol Survey in the United States, found that the contribution of neighborhood poverty to the risk of partner violence varied by racial and ethnic group, with Black but not White or Hispanic couples affected (Cunradi, Caetano et al. 2000). Likewise, Gage found that the neighborhood level of male unemployment moderated the effect of drinking in her study of domestic violence in Haiti: high male unemployment at the neighborhood level exacerbated the effects of problem drinking on all forms of intimate partner violence after controlling for other factors (Gage 2005).

Several authors have also explored the potential impact of community-related variables related to women's overall status. Koenig (2003), for example, used multilevel analysis to examine the potential impact of community-level measures of women's education, participation in a micro-credit or savings scheme, and overall autonomy on women's individual risk of partner violence in rural Bangladesh (Koenig, Ahmed et al. 2003). He found that women residing in communities with higher

means on a community-level women's autonomy index had significantly lower individual risks of experiencing domestic violence. This was also true for communities with high rates of participation in credit and savings schemes but for not for communities with higher mean levels of women's education. Belonging individually to a credit or saving scheme did not protect women from violence, but living in a community where many women belonged to such groups, did.

Significantly, Koenig also found that the impact of various measures of woman's empowerment varied depending on the community in which she lived. In the more culturally conservative district of Siranjonj, participating in a savings or credit scheme for less than two years significantly *increased* a woman's risk of experiencing partner violence, whereas in Jessore, a less traditional region, it did not. Likewise higher levels of autonomy (as measured by a derived index related to women's mobility, family decision-making power and control of resources), varied by community context. For each unit increase in the index of women's autonomy, the odds of violence increased by 60% in Sirajgonj but decreased by 12% for women in Jessore.

These findings are consistent with evidence and theory that suggests that women are most at risk when gender relations are in transition. Where it is very uncommon for women to work outside the home or to participate in development activities, to do so may increase women's risk of violence. Over time, as gender norms realign, having greater financial autonomy or resources may offer women protection from violence. Researchers have theorized that violence may be particularly likely to occur in situations in which women's increased bargaining power (or assertiveness) threatens men's sense of control and dominance (Hoffman, Demo et al. 1994; Jewkes and Abrahams 2002; Hautzinger 2003).

Two recent multilevel studies from India likewise illustrate the impact that higher-order forces can have on how other factors operate at an individual level (Ackerson, Kawachi et al. 2008; Boyle, Georgiades et al. 2009). Both studies demonstrate that community-level factors—in one case norms accepting partner violence and in a second overall literacy rates—can dampen the positive effect that completing secondary education has on women's risk of partner violence. The study by Boyle and colleagues, for example, suggests that women's education exerts much of its protective influence by altering population attitudes toward the acceptability of violence. In multilevel analysis, the strength of association between women's education and partner violence varied from one community to the next with evidence that the protective effect of higher education was less in communities with norms more accepting of partner violence (Boyle, Georgiades et al. 2009).

2.4.4 Macro-level societal factors

Theorists have proposed a number of different macro-level factors as potentially related to population differences in the levels of partner violence, including gender inequality, women's rights and status, level of violence in general, and economic inequality, among others. Most macro- or socio-cultural factors that have been hypothesized to influence population-levels of partner violence

fall into one of three categories: 1) the gender regime;[10] 2) macroeconomic factors, such as modernization, economic development, or globalization; or 3) other cultural factors.

Despite considerable theory and conjecture about how macro factors might affect the distribution of partner violence, I could find only seven studies that examined this issue empirically. Table 2.1 briefly summarizes the findings and methods of each of these studies and notes their methodological strengths and weaknesses.

Below, I review the theoretical foundation of those studies that were guided by theory. Table 2.1 summarizes and highlights some of the findings.

[10] By gender regime I mean the prevailing social system of laws, policies, values and other institutions that create and maintain male and female roles and women and men's access to social and economic power.

Table 2.1 Studies assessing the relationship between macro-level factors and partner violence

Study	Methodology	Measure of partner violence	Covariates tested	Findings
Asal & Brown 2010 71 countries	**Ordered logit & OLS regression** *Study strengths:* Large number of countries *Study limitations* Questionable measure of partner violence; mixes current with lifetime violence CEDAW poor measure of government commitment to women's rights	Country scores on 1 to 6 scale of violence severity, based on coding of qualitative and quantitative from the Women-STATS database; Coded by two coders Pair-wise correlation between the final scale and the countries with actual percentage data on partner violence available is .883 ($p<.001$)	Polity (a measure or political structure and democracy ranked from -10 to 10) GINI Index (societal level economic inequality) % of women in the labour force % of Muslims & Catholics in the country (measure of religious conservatism) Whether country has signed CEDAW (measure of governmental commitment to women's rights)	Negative association, significant *Polity* Negative association, non-significant. *Percentage women in labour force* *Signed CEDAW* *Percentage women in lower house of parliament* Positive association, significant. *GINI Index* No association *Percent Muslim or Catholic* *Pseudo R^2 =.187*
Archer 2006 40 countries	**Correlation analysis** *Study strengths:* Tests explicit theories & hypotheses *Study limitations* Uses violence data from studies of mixed quality & methodology Poor measure of attitudes; based on cross national sample of college students	Physical violence by a partner for three time periods: • Ever • Past year • Current Estimates are based on a wide range of definitions and ways to measure violence from the CTS to single item questions about being "beaten," "battered" "slapped" or subject to "physical aggression" or "regular physical aggression	GEM scale GDI scale Sex role ideology scale (SRIS) Hostile sexism sub-scale (HS) Approval of husband slapping wife Approval of wife slapping husband Individualism-collectivism scale (IC) Homicide rate Power distance (measure of Masculinity-Femininity (Hofstede)	Positive associations, significant *Hostile sexism* *Approval of wife slapping* *Collectivist social orientation* Negative associations, significant *GEM (1997 & 2004)* *GDI (1997)* SRIS *More modern gender role attitudes* No association *Homicide rates* *Approval of wives slapping husbands* *Cultural orientation toward masculinity or Femininity*

Study	Methodology	Measure of partner violence	Covariates tested	Findings
Kaya & Cook 2010 40 countries	**OLS regression** *Study strengths:* Explanatory variables are selected to test three hypothesized factors influencing levels of partner violence: women's empowerment, globalization and cultural factors *Study limitations:* Outcome measure includes past year physical violence only. Relies on violence data from both victimization surveys and family violence surveys; victimization surveys are known to yield lower estimates of violence than studies framed around relationship conflict Uses data from early studies known to be less accurate	Physical partner violence in the past 12 months, as measured in national studies conducted after 1993	Female labour force participation Female secondary school enrolment Total fertility rate Women's political rights (CIRI Human Rights Data base) Women's social rights (CIRI HR data base) Catholic population (%) Muslim population (%) Ethnic fractionalization Language fractionalization Religious fractionalization Democracy – POLITY IV project Civil liberties – Freedom House Military expenditure Trade openness as % of GDP (log) Inward FDI flow as % of GDP (log) Internet users International migration stock (log) Raw material exports (%) (log) Exports to high-income countries (%) (log)	Negative associations, sig. *GDP per capita (log)* *Female participation in non-agricultural labour force* *Female secondary school enrolment* Urbanization (collinear with GDP) Positive associations, sig. *Total fertility rate* *Religious fractionalization (in some models)* No significant association *Women's political rights* *Women's social rights* *Female labour force participation* *Trade openness* *Foreign direct investment* *Percent Catholic or Muslim* *Militarization* *Democracy* *Civil or political rights*

Study	Methodology	Measure of partner violence	Covariates tested	Findings
Palma-Solis, Vives-Cases, and Alvarez-Dardet, 2008 61 countries high and low income countries	**Multivariate logistic regression** *Study Strengths* Large number of countries *Study Limitations* Assumes all murders of women & girls are motivated by gender Only 1 African country included	*Outcome measure as stated in article*: Rate of femicide, defined as the homicide of women because of their gender *Actual outcome measure*: Rate of homicide against women and girls, 1990-1999, taken from the WHO World Report on Violence and Health, 2002)	Government final consumption expenditure Domestic consumption expenditure Gross capital formation Imports of goods and services Exports of goods and services Balance of imports and exports Civil liberties and rights index GINI coefficient General unemployment Male unemployment Female unemployment Relative advance in female employment Ratio women/men enrolled in primary school Ratio women/men enrolled in secondary school Percentage of women enrolled in primary education Percentage of urban population	Positive association (significant in bivariate analysis, non-significant in multivariate analysis) *Gross Formation of capital per Capita* *Ratio women/men in primary school* *GINI coefficient* *Domestic Consumption per capita* *Civil Liberties and Political Rights Index* *Percentage of women in primary school* *Male unemployment rate* *Relative advance in female employment* Positive and significant in multivariate model *Government expenditure per capita* *Parliamentary seats held by women*

Study	Methodology	Measure of partner violence	Covariates tested	Findings
Ackerson & Subramanian, 2008 83,627 ever-married women aged 15 to 49 living in 28 states in India	**Multi-level analysis** 1998-1999 Indian National Family Health Survey *Study strength:* Multilevel analysis *Study limitations:* Single global question for IPV likely to lead to under-reporting and misclassification Individual level controls do not account for factors known to influence risk of partner violence in India—for example, alcohol use, history of abuse in childhood, etc.	Two binary outcomes based on a single global IPV question: *Lifetime physical abuse by spouse* *Current (past 12 months) physical abuse by spouse*	Individual level variables: *age, education, age at marriage, employment status, religion, caste* Relationship variables: *Education differential between husband and wife* Household variables: *Asset wealth quintile* Neighbourhood and macro-level variables *Neighbourhood wealth, per capita state domestic product, state gender equality index, state human development index*	Negative association, significant *Level of state gender equality was inversely associated with recent IPV, even after accounting for individual covariates, neighbourhood wealth and state economic and human* development. Negative association, not significant *State human development index* Positive association, not significant State per capita GDP

Study	Methodology	Measure of partner violence	Covariates tested	Findings
(Yllo and Straus 1984)	**Ecologic** Data from 2,143 US couples collected as part of the first National Family Violence Survey; macro-level control variables; 30 US states were the unit of analysis	Women's victimization measured using the Conflict tactics scale (CTS)	Composite index of women's status composed of indicators of the extent to which women approached equality with men in their economic, political, educational and legal status	Curvilinear relationship found between the composite index of women's status and women's rate of victimization, with victimization being highest in states where women's status was lowest and highest
Straus 1994	**Ecologic analysis using OLS regression and logistic regression** 50 US states **Control variables included:** Percent black of state population (1980) Percent of population 18-24 (1980) Percent single males age 15 and older, 1980 Percent of paid labor forced unemployed, 1980	Women's victimization measured using the Conflict tactics scale (CTS)	Various measures of structural and gender inequality, Gender Equality Index – 7 indicators of economic status (e.f. ratio of the median income of women to the median income of men), four indicators of political status (e.g. percentage of women in state legislatures), and 13 indicators or women's legal status Income Inequality (Gini index) Social Disorganization – six item scale, measuring geographic mobility, divorce, lack of religious affiliation, female headed households, households headed by male with no female present, and ration of tourists to residents in each state	The authors ran their models using OLS regression on all 50 states, OLS regression on the 45 states with the most reliable data, and logistic regression. In all three cases, gender equality and social disorganization were found to be significantly related to the prevalence of wife assault at a state level (r =-0.32), although there was some interaction between the two variables. In all three cases, economic inequality, as measured by the Gini Index of income inequality, was not related to state levels of wife assault.

Gender regime. Feminist scholars have long contended that high levels of violence against women in intimate relationships derive in part from the laws, social arrangements, and patriarchal institutions that systematically subordinate women to men. Women's lack of power translates into social norms that condone, or at the very least, tolerate violence against female partners and make it difficult if not impossible for women to leave abusive relationships (Martin 1976; Dobash and Dobash 1979).

In the early 1990s, a number of theorists attempted to test the contribution of patriarchy to levels of partner violence, but these studies, which took place in the US and Canada, had only limited power to explore the issue because of the relatively small variations in women's status and gender norms across states and provinces (Straus 1994; Yllo and Straus 1984; Smith 1990) (For findings, refer to Table 2.1).

More recently, British social psychologist John Archer compared levels of partner violence and different measures of women's equality, across a range of countries. Various researchers, including Archer, have argued that as a single factor theory, patriarchy is inadequate explanation of why certain men beat their wives (Dutton 1994; Heise 1998; Archer 2000; Felson 2002). But as Archer observes, "When we move from the level of the individual to that of nations or cultures, variations in the position of women may well explain variations in the extent of partner violence, not only by men against women but also by women against men."

Archer's study demonstrated a number of intriguing findings:

1. Levels of wife abuse across setting were strongly negatively correlated with women's empowerment, as measured by the Gender Empowerment Measure and Gender Development Index (r= -0.63 for current violence; r= -0.69 for past-year partner violence).
2. The higher the degree of gender empowerment in a country, the lower the sex difference in male to female aggression (i.e. the higher the rate of female aggression against male partners).
3. Homicide rates and cross-national statistics on criminal assault were largely unrelated to levels of women's victimization. Controlling for homicide rates also had little impact on the association between gender empowerment and women's victimization. Archer took this to mean that the factors driving partner violence are different from those driving other crime.
4. Higher societal power for women is strongly correlated with a cultural orientation toward individualism versus collectivism. In "collectivist" cultures, women are expected to subordinate their own needs to the good of the family and community.
5. Lower societal power for women was strongly correlated with more traditional and sexist attitudes toward women, which in turn were associated with higher levels of violence against female partners.[11]

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[11] This analysis used two measures of attitudes toward gender roles, the Sex Role Ideology Scale Williams, J. and D. Best (1990). Measuring sex stereotypes: A multinational study. Beverly Hills, CA, Sage., which involves

These findings are largely consistent with evidence emerging from statistical analysis of the ethnographic record. Using coded ethnographic data from 90 small-scale societies, Levinson looked for factors that consistently distinguished societies where wife beating was common from those where it was rare or absent (Levinson 1989). Levinson's analysis suggests that wife beating occurs more often in societies where men have economic and decision-making authority in the household, where women do not have easy access to divorce, and where adults routinely resort to violence to resolve their conflicts. The second strongest predictor of frequent-wife beating was the absence of all-woman work groups. Levinson hypothesizes that the presence of female workgroups offer protection from wife beating by providing women with a stable source of social support as well as economic independence from their husbands and families. Interestingly, in societies with all-woman work groups, the frequency of wife beating decreases, but the likelihood of women hitting men, goes up. While some of these factors operate at the community or household level, the findings suggest that laws or policies that disadvantage women or make it difficult for them to leave abusive relationships (like restrictive divorce laws), may affect overall levels of domestic violence.

Various other studies have examined the association between levels of partner violence and other measures of women's social and economic power, such as number of women in a country's house of parliament, female secondary school enrollment, women's political and economic rights, and whether or not a country had signed the Convention on Elimination of All Forms of Discrimination against Women (CEDAW) treaty. Most studies have also relied on one or more aggregate measures of gender inequality or women's empowerment, such as the Gender Empowerment Measures (GEM) or the Gender-related Development Index (GDI) constructed by various agencies to compare women's status across countries (see Chapter 8, Box 8.1 for more information on these measures).

Macroeconomic factors. Some theorists have proposed that rates of partner violence naturally decline as societies modernize or are exposed to more progressive ideas through globalization and economic integration (Kaya and Cook 2010). Others have emphasized the role that women's access to formal wage employment can have on promoting more gender equitable norms and policies (Seguino 2007). Interestingly, most researchers who have emphasized macroeconomic factors hypothesize that they work through affecting women's status and gender-related norms.

Ronald Inglehart and Pippa Norris, for example, argue that as societies modernize people become more secure and less worried about survival issues. Their focus shifts from economic and physical security toward subjective well-being, quality of life, and self-expression (Inglehart and Baker 2000). This shift in values occasions greater commitment to gender equity and tolerance of "out-groups," which in turn facilitates the emergence of democratic values and more equitable gender norms. They note that the speed at which transformation in gender norms occurs can be affected by a society's religious heritage, with societies rooted in Catholic, Orthodox, Confucian or Muslim cultural

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30 statements measuring traditional versus modern attitudes toward gender roles and the Hostile and Benevolent Sexism scales that acknowledge the some sexist attitudes can be benevolent but paternalistic while others may be hostile toward women.

traditions often taking longer to adopt more progressive attitudes. They cite evidence for their theory using data from the World Values Survey (Inglehart, Norris et al. 2002).

Others argue that the views of modernization theorists are overly simplistic. They note that not all societies modernize in the same way, nor do all citizens share a common set of values at a similar level of economic development (Steel and Kabishima 2008). These theorists argue that it is important to examine development's impact on women more critically, taking into account historical and other structural factors. As a generation of gender and development scholars have pointed out, the fruits of economic development can distribute inequitably unless special attention is paid to how development policies and programs intersect with existing gendered power structures (Tinker 1990; Visvanathan and et.al. 2002). Also governments—through tax law, market regulations, and child care policies—can either reinforce existing gender hierarchies, as was the case in Japan, Singapore, South Korea, Hong Kong and Taiwan, or promote an ideology of gender equality, as was done in the former Soviet Union (Steel and Kabishima 2008).

In point of fact, most researchers testing macroeconomic factors have done so with little theoretical clarity. In their ecological study of femicide (the killing of women because of their gender), for example, Palma-Solas and colleagues examined the association between homicides of women and a range of economic factors including domestic consumption, gross capital formation, imports and experts per capita, and income inequality. They offered little explanation, however, about how or why these factors might be related to gender-based violence (Palma--Solis, Vives-Cases et al. 2008).

Other cultural factors. A final area of investigation has been the role that culture may play in determining the risk of partner violence. Here researchers have examined religious heritage, individualist versus collectivist cultural orientation, and cultural notions of honor linked to male status and female purity.

As mentioned previously, researchers have demonstrated in cross-national studies that levels of partner violence are higher in "collectivist" cultures compared to "individualist" cultures (Archer 2006). Collectivism represents the degree to which individuals see themselves as part of a group, family, or community, whose goals take precedence over those of individuals (Triandis 1995). One of the downsides of a collectivist orientation, is that it reinforces the notion that women should sacrifice their own wellbeing for the good of the family.

Researchers also have demonstrated associations between cultures of honor and various forms of violence against women, including partner violence (Vandello and Cohen 2003; Vandello and Cohen 2005). Honor cultures—such as those present in certain Mediterranean societies such as Greece and Spain, parts of Latin America with Iberian roots, and certain Middle East and Arab cultures—share three qualities that increase their propensity toward partner violence: a strong collectivist orientation that stresses integrity of the family and its reputation over individual priorities; 2) concern with female purity as an emblem of family honor; 3) and notions of male status linked to honor and dominance over women (Vandello and Cohen 2003; Welchman and Hossain 2005).

2.5 Revised conceptual framework

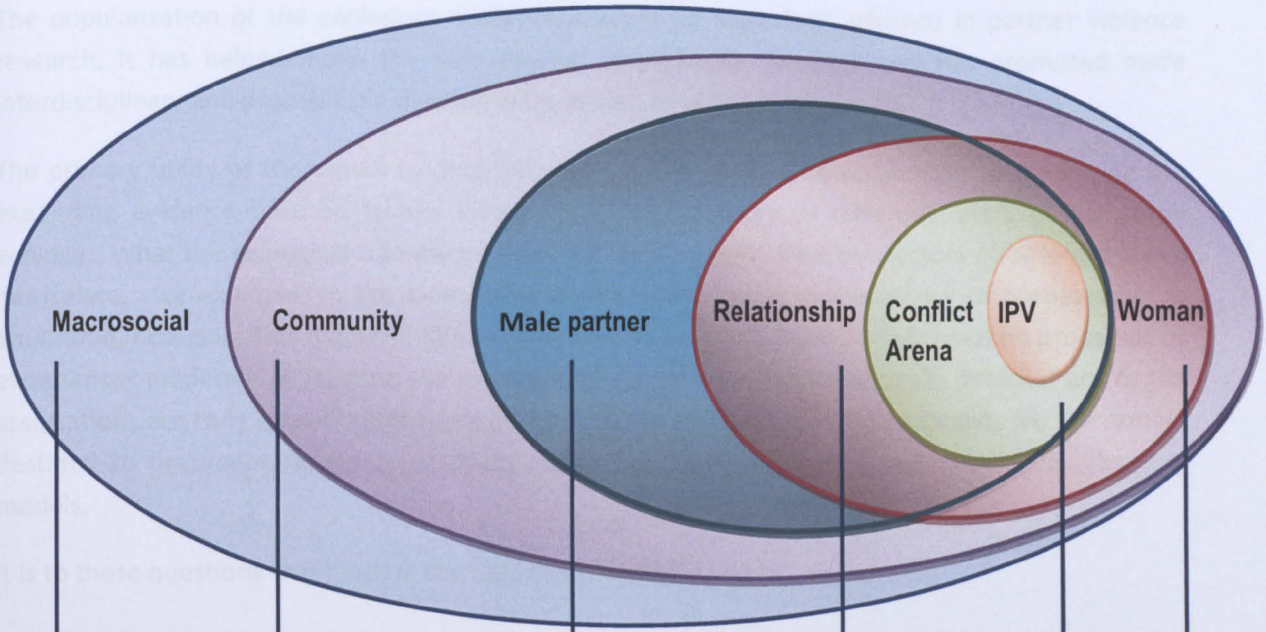
In light of the above review, I reworked the conceptual framework that I first advanced in 1998. Significantly, it seemed important to separate out factors related to risk of victimization for women and perpetration for men. Although there is clearly evidence that women perpetrate partner violence, data are still inadequate at this juncture to establish whether the risk factors for women's perpetration of partner violence are the same or different than those for men. My revised framework therefore summarizes knowledge for women's risk of victimization and men's risk of perpetration.

The 1998 review also drew on insights from research on both partner violence and rape by non-intimates. While the risk factors for these two behaviors clearly overlap, there are also unique biological and situational factors that contribute to rape and sexual abuse of children (World Health Organization 2010). The revised framework draws exclusively on research related to intimate partner violence.

The reader may take note of several factors not discussed extensively in this chapter—namely conduct disorder, antisocial behavior, and delinquent peers among men, as well as macro level factors such as impunity from violence. I review the data on conduct disorder and other developmental correlates of abuse in the next chapter. The macro-level items noted include various factors that have some evidence linking them to the population distribution of partner violence, but have not been fully evaluated. I leave them in to encourage further research. Several of those noted, such as ease of divorce, are factors suggested by ecological analysis of factors associated with the presence or absence of partner violence among small-scale societies in the Human Area Relation Files (Levinson 1989).

The revised framework is illustrated in Figure 2.4.

Figure 2.4 Revised conceptual framework for partner violence



Gender Regime

Lack of economic rights & entitlements for women

Discriminatory family law

Ease of divorce for women

Composite measures of gender inequality

Cultural Factors

Collectivist versus individual cultural orientation

Emphasis on women's purity & family honour

Economic Factors

Level of development

Women's access to formal wage employment

Norms

Acceptance of wife beating

Male right to discipline/ control female behavior

Tolerance of harsh physical punishment of children

Stigma for divorced or single women

Norms linking male honour to female purity

Family privacy

Lack of Sanctions

Lack of legal or moral sanction for violence

Others do not intervene

Neighborhood

Community violence

High unemployment

Low social capital

Poverty

Violence in Childhood

Harsh physical punishment

Witnessing parental violence

Other childhood traumas

Psychological Dysfunction

Antisocial behavior

Adult attachment issues

Attitudes

Accepting of violence as a means to resolve conflict

Acceptance of partner violence

Gender hierarchical or transitional attitudes

Alcohol Abuse

Gender Role Conflict

Delinquent Peers

Socio-demographic

Young

Low educational level

Interaction

Non-equalitarian decision making

Poor communication

High relationship conflict

Conflict Arena

Situational triggers

Sex/ infidelity

Money/distribution of family resources

Children or in-laws

Division of labor

Male drinking

Patriarchal Triggers

Female challenge to male authority

Failure to meet gender role expectations

Assertions of female autonomy

Childhood Violence

Child sexual abuse

Other childhood traumas

Witnessing mother being beaten

Attitudes

Tolerance of wife beating

Socio-demographic

Young age (for current violence)

High educational attainment (protective)

Low social support

Factors that operate differently in different settings:

Women's employment

Participation in credit schemes or other development programs

Asset ownership

2.6 Summary

The popularization of the ecological model represents an important advance in partner violence research. It has helped move the field beyond single-factor theories and has prompted more interdisciplinary and probabilistic thinking with respect to violence causation.

The primary utility of the model to date, however, has been as a heuristic tool for organizing the expanding evidence base on factors linked to partner violence at different levels of the social ecology. What the ecological framework does not do is suggest how the factors at different levels interrelate. For example, to the extent that abuse in childhood increases risk of perpetration in adulthood, how does this happen? What factors combine to increase risk? Do certain processes or experiences moderate or mediate the associations described in the literature? Which if any of the associations are truly causal? Until we begin to theorize and test possible pathways, we will remain destined to document simple associations rather than evaluate and refine possible explanatory models.

It is to these questions that I turn in the following chapter.

Chapter 3: Hypothesized Causal Pathways For Violence Perpetration and Victimization

This chapter reviews the evidence available on hypothesized relationships among variables at different levels of the social ecology.

- The first section describes pathways to perpetration for men.
- The second section describes pathways to victimization for women.
- The final section highlights strengths and weaknesses of the extant literature.

As evidenced in Chapter 2, the bulk of quantitative research available on partner violence in the developing world comes from cross-sectional surveys among representative samples of individuals in the general population. While useful for establishing the dimensions of the problem, establishing causality requires ascertaining the sequencing of events—a conceptual challenge that cannot be easily tackled in cross-sectional surveys.

Nonetheless, cross-sectional studies can suggest potential hypotheses for future testing and can probe issues around possible interactions between factors operating at different levels, especially when more advanced techniques such as multilevel modeling, causal diagrams, and structural equation modeling are employed. To fully exploit such methods, however, one needs a well-developed theory of how different factors interrelate as well as clarity on factors that could confound the relationship of interest.

As Galea and Ahern observe:

> The principal danger of having underdeveloped theoretical frameworks is that multilevel analyses run the risk of becoming another form of "black box epidemiology" (20), where the associations between "exposures" and "outcomes" are explored, without a theoretical basis for why such associations should exist and why specific factors would cause particular diseases (Galea and Ahern 2006).

With rare exception, this is how the ecological model of partner violence has been used to date. As a result, little thought has been given about what factors may mediate relationships, which associations are likely consequences of abuse rather than risk factors, or where effect modification may be present.

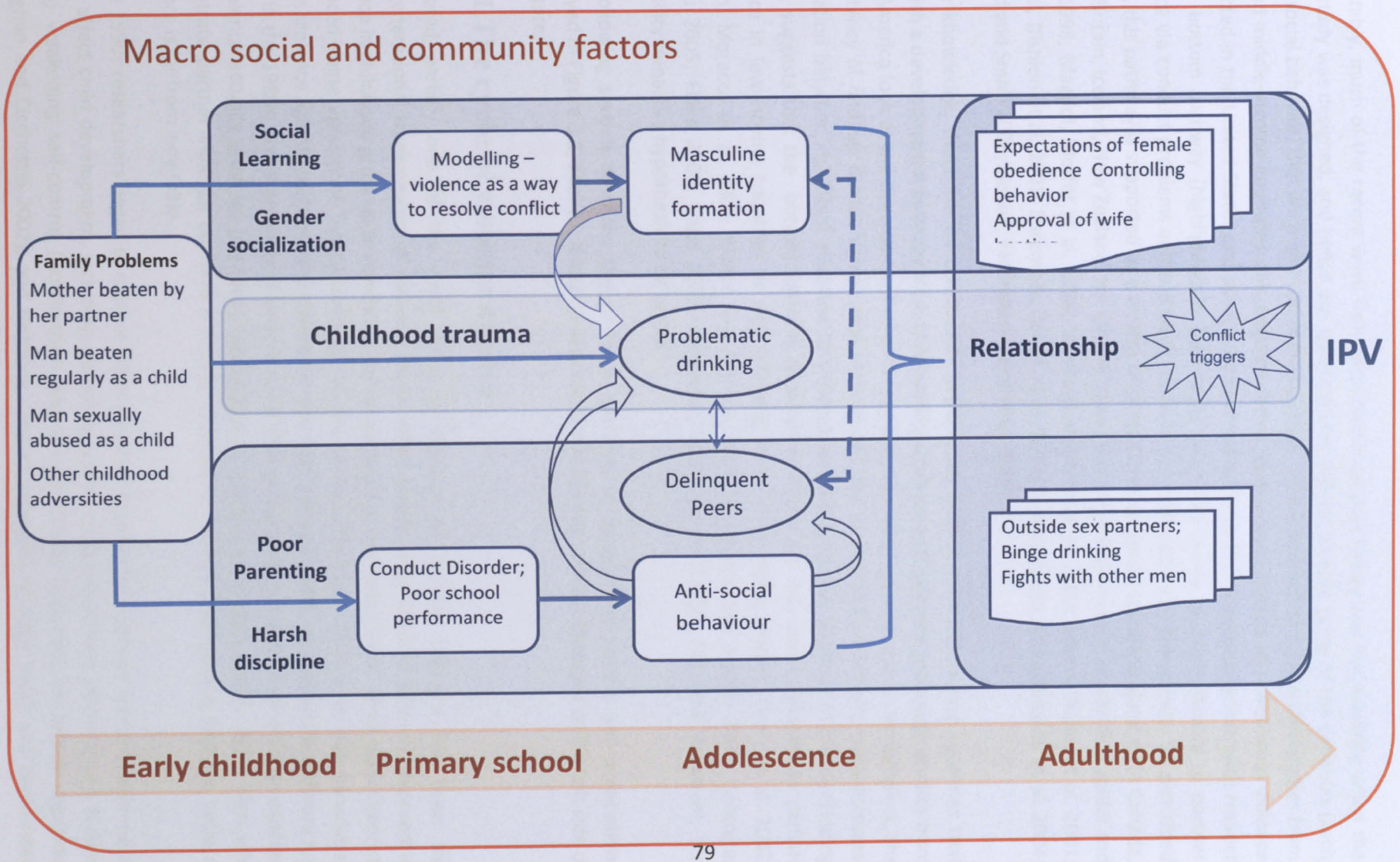
In an effort to push myself and the field toward more thoughtful consideration of these issues, I developed two hypothesized pathway diagrams—one depicting pathways to perpetration by male partners and a second depicting pathways to victimization among women [see Figure 3.1 and Figure 3.2]. To do so, I drew upon evidence from the developing world as well as exciting new insights emerging from the fields of developmental psychology and delinquency studies about how conduct

problems among boys, including aggression and violence, evolve in childhood and adolescence and progress, in some cases, to partner violence in adulthood. I will use these diagrams when developing and testing models of an individual woman's odds of experiencing partner violence (Chapter 6) and community level factors affecting the distribution of partner violence between settings (Chapter 7).

3.1 Pathways to perpetration for men

Figure 3.1 illustrates my working theory of how the various factors included in the WHO study (and some key factors not measured) combine to increase risks of men's perpetration of partner violence. It should be read from left to right, representing the developmental course of partner violence across the life span. The left most box highlights adverse experiences in childhood that interact with other life course stages and experiences to increase the likelihood that some men will go on to perpetrate violence in their intimate relationships. Collectively, these experiences translate into increased propensity toward partner violence through a number of interrelating processes, one through antisocial behavior (the bottom pathway, highlighted in the blue box); one through social learning and gender socialization (the top trajectory highlighted in blue) and one through trauma (the middle trajectory). Once a relationship is formed, factors related to the woman and to the dynamic of the couples' relationship also become defining as to whether violence will occur and under what circumstances. Throughout the life course, macro-level factors related to culture, the economy, the gender regime, among other factors, influence and structure prevailing norms, the dynamics of relationships, and the construction of individual-level attitudes and beliefs.

Figure 3.1 Developmental paths to perpetration by men



Regrettably, much of the recent work from developmental psychology was not available when the WHO study was designed, and hence our questionnaire did not include some of the variables (such as antisocial behavior) that we might consider key today. In the absence of comparable studies from low and middle-income countries, this diagram draws heavily from studies of relationship violence conducted in the United States and other industrialized nations. This is especially true with respect to the bottom pathway (highlighted in light blue) that links family of origin factors to partner violence via conduct problems and antisocial behavior in childhood and adolescence. As described below, this pathway is supported by a wealth of prospective empirical studies originating in Canada, Great Britain, Iceland, New Zealand, the United States and other high-income countries (Capaldi and Clark 1998; Magdol, Moffitt et al. 1998; Swinford, DeMaris et al. 2000; Brame, Nagin et al. 2001; Capaldi, Dishion et al. 2001; Ehrensaft, Cohen et al. 2003; Gudlausdottir, Vilhajalmsson et al. 2004; Ireland and Smith 2009; Lussier, Farrington David et al. 2009).

To my knowledge, there are no comparable prospective studies from developing countries that establish a developmental pathway from childhood to adult partner violence (although studies from Latin America look at the development of antisocial behavior among young men). Nonetheless, the consistency of findings across high-income settings and the strong and consistent, cross-sectional association between childhood exposure to violence and adult partner violence in the developing world, suggests that the bottom pathway depicted in Figure 3.1 may prove relevant to partner violence in low-income countries as well (Ellsberg, Peña et al. 1999; Jewkes, Levin et al. 2002; Martin, Moracco et al. 2002; Kishor and Johnson 2004; Abrahams and Jewkes 2005; Contreras Urbina 2005; Flake 2005; Gage 2005; Abramsky, Watts et al. 2011). For now, however, this possibility remains a hypothesis to be tested.

The following section describes the evidence available to support the factors and associations displayed in Figure 3.1, above. It begins with the family of origin factors depicted on the left side of the figure.

3.1.1 The cycle of violence theory

As noted earlier, one of the most enduring theories of partner violence has been the intergenerational transmission of violence thesis, which argues that children who are exposed to violence in childhood grow up to reproduce similar patterns in their adult lives. Most early theorists advanced some version of "social learning" theory to describe how violence in one generation begets violence against partners and children in the next (O'Leary 1988). Social learning theory lost favor in the 1980s, however, when it became clear that only a small proportion of children exposed to violence actually grow up to repeat the pattern in adulthood (Widom 1988). Most men who perpetrate partner violence *do* have a history of violence in their background, but the cycle of violence is far from inevitable.

In the 1990s researchers began to explore other means through which abusive home environments could affect child development, including disrupting parent-child attachment (Morton and Browne 1998); weakening self-control (Gottfredson and Hirschi 1990); impairing emotional regulation (Maughan and Cicchettia 2002); and fostering conduct problems through harsh and inconsistent

parenting (Swinford, DeMaris et al. 2000). Researchers also began to explore resilience among maltreated children, and why some became disruptive and aggressive and others did not (Masten 2001). Eventually, theories like social learning regained favor as it became clear that multiple mechanisms likely interact to determine whether a child exposed to violence goes on to repeat the pattern in adulthood.

3.1.2 Childhood violence: Causal factor or risk marker?

Although the underlying mechanism may be unclear, there is nonetheless a strong and consistent association between witnessing parental violence in childhood and later perpetrating partner violence. It is difficult to sort out whether this relationship is causal or merely a marker for other factors that are the source of the association. In cross-sectional studies, being abused physically and witnessing IPV as a child are both related to perpetrating IPV. But these experiences may often co-occur with a variety of other childhood adversities, such as other forms of maltreatment, growing up in poverty, having parents who abuse drugs or alcohol, and exposure to mental illness (Felitti, Anda et al. 1998; Dong, Anda et al. 2004; Hamby, Finkelhor et al. 2010).

Indeed, there is strong evidence that types of abuse overlap in families as do various other dysfunctions—hence the box representing early childhood environment on the left side of the diagram includes "beaten as child", "mother abused" and other "childhood adversities." Regrettably, most studies still tend to look at various adversities in isolation, making it difficult to establish whether certain experiences are more salient for different outcomes than others. One exception is the Adverse Childhood Experiences (ACE) study, which has studied the long-term consequence on health and development of eight different childhood adversities among 8629 men and women who are long-term subscribers to a health maintenance organization in California. This study has demonstrated a strong and graded relationship between the number of adversities an individual experienced in childhood and numerous health and social outcomes, including partner violence (Whitfield, Anda et al. 2003; Anda, Felitti et al. 2006). Experiencing physical or sexual abuse in childhood or growing up with an abused mother each individually increased the risk of perpetration and victimization of IPV roughly two fold in adjusted analysis (Whitfield et al 2003). Experiencing four or more adverse experiences, regardless of type, increased the odds of perpetrating IPV more than 5 fold (aOR 5.5; 95CI 3.8-7.8) (Anda, Felitti et al. 2006).

Researchers found similar results when administering the ACE questionnaire along with questions about adolescent violence to school-based youth in 6th, 9th and 12th grade in Minnesota. Each type of adverse event in childhood was significantly associated with a range of adolescent violence perpetration (bullying, dating violence, weapon carrying to school and physical fights) as well as self-directed violence (self-mutilation, suicide ideation and suicide attempts), after controlling for sociodemographic factors. The likelihood of perpetration of dating violence, for example, increased 8 to 45-fold among boys who had been physically or sexually abused and 2.6 to 3.4-fold among girls who had been abused (Duke, Pettingell et al. 2010). Like the HMO survey, this study found a graded response between violence perpetration and number of adverse events experienced.

Neither of the above studies, however, adjusted for the co-occurrence of adverse events besides childhood exposure to violence. So the question remains: Does early exposure to violence make a

unique contribution to later partner violence over and above the impact of growing up in a dysfunctional home?

Only a handful of studies have addressed this more nuanced question. Most have found that the impact of early violence exposure persists even after controlling for other family and social stressors. In a retrospective cohort study of 3023 adults in metropolitan Paris, for example, there was still an independent effect of having witnessed partner violence in childhood on the odds of partner violence (aOR3.2; 95% CI: 1.8, 5.7), even after adjusting for a wide range of background factors including parental incarceration, parental alcohol abuse, parental suicide, separation or divorce, physical or sexual abuse in childhood, parental unemployment, housing problems, and family financial problems (Roustit, Renahy et al. 2009). There was also an independent effect of physical abuse [6.09 (2.95 to 12.55)] and sexual abuse in childhood [2.56 (1.06 to 6.22)] on the risks of partner violence in adulthood.

3.1.3 Insights from longitudinal studies

In the 1990s longitudinal studies began to shed light on how early childhood experiences combine with biological predispositions, family environment, and the context in which a child is born to set in motion a series of adjustment and behavioral problems that can evolve into antisocial behavior and partner violence (especially if other factors hone this trajectory over time). Most of this work evolves from the fields of developmental psychology and delinquency studies that have converged on a model that links exposure to violence in childhood to increased behavioral problems in grade school and increased risk of violent and aggressive behavior in adolescence and adulthood (including toward intimate partners). Among boys, these early behavioral problems frequently take the form of lying, disruptive behavior, and getting in trouble in school—a constellation of behaviors termed "conduct disorder" by psychologists.

Indeed, childhood behavior problems and antisocial behavior in adolescence have routinely been linked to adult physical partner violence in longitudinal studies violence (Capaldi and Clark 1998; Magdol, Moffitt et al. 1998; Swinford, DeMaris et al. 2000; Capaldi, Dishion et al. 2001; Ehrensaft, Cohen et al. 2003). For example, in her 20-year study of a community sample of children in upstate New York, Ehrensaft and colleagues (Ehrensaft, Cohen et al. 2003) found that conduct disorder was one of the most robust predictors of partner violence in both perpetrators and victims.

While physical abuse in childhood more than doubled the risk of partner violence net of demographic factors (aOR 2.21; 0.81-6.01), once conduct disorder was included in the perpetration model, physical abuse became insignificant. This suggests child maltreatment partially works through increasing risk of developing conduct problems by early adolescence and that conduct problems is on the causal pathway between child maltreatment and partner abuse (Ehrensaft, Cohen et al. 2003). If considering only the more severe cases of partner violence (those that cause injury), child physical abuse remains significantly associated with partner violence over and above conduct disorder, suggesting that child abuse may work through pathways other than conduct problems as well.

Moreover, exposure to violence between parents and harsh punishment remain potent predictors of partner violence perpetration even after conduct disorder is introduced to the model, an

observation that suggests that elements of social learning theory may also be at play. The authors observe, "Although CD [conduct disorder] mediates the effect of incidents of child abuse, it does not appear necessary to develop CD for early family lessons of coercive, aggressive conflict resolution within intimate partnerships to generalize to youths own intimate relationships."

Thus, the Ehrenstadt study suggests that partner violence evolves in part from a pattern of aggressive and antisocial behavior rooted early in childhood, but that there are other pathways also leading to increased risk of violence among intimates.

3.1.4 The antisocial pathway in more depth

There is now a general consensus that the development of conduct disorder and antisocial behavior involves an extended interplay of factors operating at the individual, relationship, and environmental level (Capaldi, Kim et al. 2009). These processes include dynamics in the family (such as the degree of parental warmth and style of discipline); dynamics at school (such bullying and forming friendships) and association with peers, especially in adolescence. Children raised in relatively warm and caring environments with caretakers who are responsive to their needs, learn to expect and reciprocate care and affection and they later generalize these models to relationships with others (Bowlby 1969). Those who are raised with harsh and inconsistent parenting, who witness violence between their parents or who are maltreated themselves, fail to develop healthy emotional and social skills and predispose the child to behavioral problems.

As the child enters school, his disruptive behavior and lack of skills undermines academic performance and heightens the likelihood that he will be rejected by his peers—itself a potent risk factor for conduct problems (Laird, K et al. 2001). Dodge and colleagues found that children who were rejected for at least two years by second grade, had a 50% chance of displaying clinically significant conduct problems later in adolescence, in contrast with just a 9% chance for children who manage to avoid early peer rejection. These projections held even when the behaviors that may have been the reason for peer rejection were statistically controlled (Dodge, Lansford et al. 2003).

If problems persist, antisocial behavior, peer rejection, and deficits in academic skills tend to channel children with conduct problems toward deviant peer groups, which in turn reinforce deviant behavior, including aggression. Adolescence is a period when the influence of peers in critical in terms of establishing norms, values and behaviors. Problem teens tend to gravitate toward others like themselves and "rule breaking" and other forms of antisocial behavior can become potent glue for consolidating friendship networks.

Some scholars have even conceptualized this process as "deviancy training," and have noted how "rule breaking talk" and hostile talk about women frequently serve as the foundation for male bonding (Dishion, Andrews et al. 1995). This "deviancy training" has been linked in prospective studies to increased antisocial behavior in late adolescence even after controlling for early harsh discipline and conduct problems in childhood (Dishion, Eddy et al. 1997). It has also been linked specifically to later aggression toward intimate partners. In a longitudinal study that followed 9-year-old boys through adulthood, antisocial behavior and deviant peer associations in adolescence predicted future aggression toward women. Path analysis showed that hostile talk about women with peers partially mediated the impact of earlier antisocial behavior and peer clustering on later

partner violence (Capaldi, Dishion et al. 2001). The reinforcing relationships between delinquent peers, hostile talk about women, and masculine identity is represented in Figure 3.1 by the dashed line linking association with delinquent peers and formation of masculine identity.

As these young people transition to early adulthood, they tend to seek romantic partners from their existing friendship networks, meaning that they tend to selectively partner with other aggressive, emotionally-unskilled and deviant youth (Krueger, Moffitt et al. 1998; Kim and Capaldi 2004). This is thought to be particularly problematic for girls whose partnering with aggressive and otherwise antisocial males has been found to worsen their developmental outcomes more so than for boys (Moffitt, Caspi et al. 2001; Ehrensaft 2008).

3.1.5 Alternative pathways through gender socialization and trauma

As the Ehrensaft study observes, it is not necessary to develop antisocial behavior to perpetrate partner violence, even though these two constructs appear closely linked in high-income settings. Alternative pathways to IPV may be particularly relevant in settings that are more traditional where strong patriarchal norms condone the beating of women as a form of chastisement for challenging male authority or failing to fulfill gendered expectations regarding female behavior. As noted previously, in many settings, both men and women consider beating of women justified for infractions such as disobeying a husband's order, failing to perform childcare or household duties appropriately, or being seen with outside men (Zimmerman 1995; Schuler, Hashemi et al. 1996; Rao 1997; Go, Johnson et al. 2003). In the WHO study for example, between 6% of women in Belgrade Serbia to more than 68% of women in the provinces of Bangladesh, Ethiopia, Peru and Samoa agreed with one or more of the listed justifications for wife beating (World Health Organization 2005). These attitudes evolve from social norms that grant men the right to police female behavior and that reinforce notions of male dominance in the family.

The upper pathway highlighted in blue in Figure 3.1 emphasizes the role that social learning and gender socialization play in shaping attitudes and behaviors that promote partner violence. Through exposure to violence in childhood—either as victims themselves or as witnesses to violence against their mother—male children learn that violence is an "effective" strategy to enforce one's will or secure tangible and symbolic rewards. According to social learning theory, the impact of observed behavior is strengthened if a child observes few negative consequences of the behavior and if society writ large reinforces its acceptability (e.g. through television or through social norms that lend support for the behavior)(Bandura 2006).

Not surprisingly, the highest incidence of physical aggression is found in communities where aggressive role models are common and fighting prowess is regarded as a valued attribute (Wolfgang 1967; Short 1968). Likewise, research has shown that people who are commended for behaving aggressively in fact become more aggressive, whereas the likelihood of violence dampens where it is treated as not praiseworthy (Bandura 1978). It is in this context that social learning interacts with processes of gender socialization in the family. If boys are rewarded for being aggressive and ridiculed for timidity; if they are encouraged to believe that girls owe them deference and that the natural order grants them authority over girls and women; then it is easy to see how male aggression against women becomes normalized.

According to Bandura, the lessons learned in early childhood are either reinforced or countered as boys enter school and begin to explore the wider world. Here the larger gender regime—laws, policies, norms, and ideologies—come into play, structuring access to material and symbolic resources along gender, class, and ethnic lines among others. Social learning theory also posits that individuals judge the "acceptability" of their behavior according to both internal standards (congruence with moral standards, their physiologic response to perceived options) and external standards (social norms, reaction of others) before weighing the pros and cons of acting.

Thus, gender regimes that reinforce male authority and posit men's right to control female behavior are likely to influence this personal assessment process. As discussed in section 2.4 above, attitudes supportive of wife beating have consistently been linked to higher odds of perpetrating as well as experiencing abuse. I posit that norms related to "proper" male and female behavior, to the roles that men should fulfill in the family, and to how masculinity is linked to drinking and sexuality, are likely key mediators between macro level factors and individual attitudes and beliefs that encourage partner violence. In my diagram, individual-level behaviors that have been linked in the literature to the perpetration of partner violence—including acceptance of wife beating, binge drinking, and having outside sexual partners—are a function both of early developmental experiences, social learning and the internalization of community norms structured by more macro level factors.

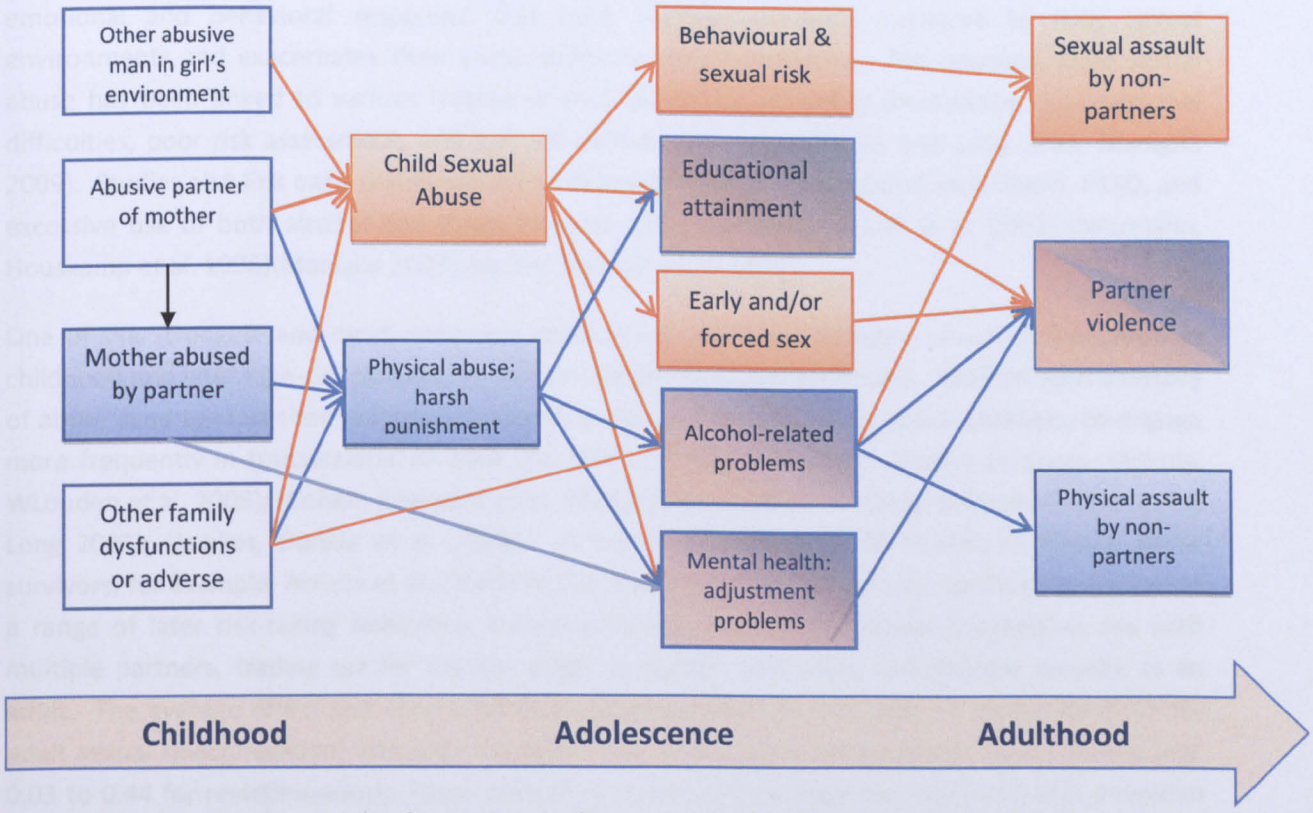
A final pathway through which early exposure to violence can increase the propensity toward partner violence, is through the cascade of behavioral, biologic and neurodevelopmental responses that early trauma can trigger. Research from the high-income countries has documented that experiences of trauma and stress in early childhood can produce chronic activation of the body's stress response and permanently alter the development of brain, especially in critical areas involved in emotional regulation (Middlebrooks and Audage 2008). This can cause an individual to develop a low threshold for stress, thereby becoming overly sensitive and reactive to adverse experiences through life.

Trauma and stress related responses also increase the likelihood that children will go on to abuse alcohol and other drugs. In the CDC-sponsored ACE study, for example, as the frequency of witnessing partner violence increased, the likelihood of reported alcoholism, illicit drug use, IV drug use and depression also increased. Exposure to physical abuse, sexual abuse, and having a mother treated violently, resulted in men being 3.8 times more likely to report perpetrating partner violence themselves (Whitfield, Anda et al. 2003).

3.2 Pathways to victimization for women

Figure 3.2 summarizes my working theory of how various life course factors combine to increase the odds that a woman will become a victim of partner violence at some point in her life. This diagram emphasizes pathways and how the various factors operating in the social ecology combine to mediate and potentially moderate the path between variables. Factors linked to child sexual abuse are highlighted in orange; those linked to harsh physical punishment and abuse are highlighted in blue; and those that are associated with both are variegated.

Figure 3.2 Pathways to victimization for women



As with perpetration, the seeds of victimization begin in early childhood where exposure to violence (either as a victim or as an observer) heightens risk for a series of behavioral responses that translate into greater odds of experiencing partner violence in adulthood. A great number of studies have examined the long-term effects of child sexual abuse on women (and men to a lesser degree), and an expanding literature exists on the developmental impacts of being exposed to partner violence in childhood. Prospective and retrospective studies consistently find a significant association between childhood sexual abuse and later partner violence as well as elevated risk of partner violence for women whose mothers were beaten (Coid, Petruckevitch et al. 2001; DiLilo, Giuffre et al. 2001; Whitfield, Anda et al. 2003; Dunkle, Jewkes et al. 2004; Jeyaseelan, Kumar et al. 2007; Vung and Krantz 2008; Daigneault, Heberg et al. 2009; Friesen, Woodward et al. 2010; Abramsky, Watts et al. 2011).

There is a less well developed literature on the possible role that early physical abuse or neglect may play in exposing women to heightened risk of later partner violence and physical abuse by nonpartners in adolescence and adulthood (Friesen, Woodward et al. 2010; Olsen, Parra et al. 2010). Regrettably, the WHO study did not inquire about women's own experience of beatings or harsh punishment in childhood—an omission that is a most unfortunate because it limits our ability to adjust for this possibly confounding factor.

Systematic and empirical reviews of the literature find a strong association between sexual abuse in childhood and sexual revictimization by nonpartners in adolescence or adulthood (Roodman and Clum 2001; Messman-Moore and Long 2003; Dunkle, Jewkes et al. 2004; Arriola, WLouden et al.

2005; Barnes, Noll et al. 2009; Fargo 2009; Maniglio 2009). Researchers have advanced and tested many theories about how early sexual trauma might work to increase risk of later sexual assault, although findings are still mixed. Many studies suggest that sexual abuse sets up a cascade of emotional and behavioral responses that both increase women's exposure to risky sexual environments and exacerbates their vulnerability to sexual predation. For example, child sexual abuse has been linked to various trauma-related responses, including dissociation, interpersonal difficulties, poor risk assessment, and low self-esteem (Messman-Moore and Long 2003; Maniglio 2009). Studies also link early sexual trauma to depression, lower educational attainment, PTSD, and excessive use of both alcohol and drugs (Jumper 1995; Paolucci, Genuis et al. 2001) (Neumann, Houskamp et al. 1996)(Maniglio 2009) (Sartor, Agrawal et al. 2008).

One of the strongest and most consistent associations has been between sexual victimization in childhood and later high-risk sexual behaviors in adolescence and adulthood. Women with a history of abuse tend to start their voluntary sexual lives sooner, to have more sexual partners, to engage more frequently in transactional or paid sex, and to combine sex with alcohol or drugs. (Arriola, WLouden et al. 2005); (Cohen, Deamant et al. 2000); (Hahm, Lee et al. 2010); (Messman-Moore and Long 2003); (Jewkes, Dunkle et al. 2006). In her meta-analysis of 46 studies of female abuse survivors, for example, Arriola et al. (2005) found that child sexual abuse was significantly related to a range of later risk-taking behaviors, including having unprotected sexual intercourse, sex with multiple partners, trading sex for money, drugs or shelter, and being revictimized sexually as an adult. The average effect size across the four outcome variables was small to moderate (0.17 for adult sexual revictimization) although the effect size within each meta-analysis varied widely (e.g. 0.03 to 0.44 for revictimization). These behaviors collectively increase the likelihood that a woman will find herself either in a dangerous situation (e.g. drunk at a party) or with a dangerous sexual partner.[12]

Interestingly, while use of alcohol and intoxication clearly increases one's risk of sexual victimization, it does not appear to fully explain the relationship between prior sexual abuse and subsequent victimization. In some studies, alcohol use mediates the relationship between child sexual abuse and revictimization but the association never completely disappears, suggesting that other factors remain at play (Messman-Moore and Long 2003). Alcohol use also fails to consistently predict revictimization in prospective studies (e.g. (Gidycz, Hanson et al. 1995)). Messman-Moore and Long remind us that the variables that intervene between child sexual abuse and adult sexual assault (or partner violence for that matter) are likely not to operate in isolation. In addition, different factors may mediate the association in different women or at different moments in time. These authors

[12] Tests for interaction between effect size and the type of sample (community, clinical, school, other), definition of sexual abuse (non contact or contact, at least contact, at least penetrative), and the age of victim (≤13; ≤16; ≤ 17), did not suggest effect modification. In other words, within group variability remained significant under all three potential moderators. Only with sex trading were effect sizes larger for definitions of child sexual abuse based on a maximum victim age of 14–17 years.

encourage researchers to think in terms of functional outcomes of different symptom groups. For instance, intoxication and dissociation are two distinct phenomena, but both lead to decreased awareness of one's surroundings and a reduced ability to perceive and respond to danger. As such, either factor could serve to increase vulnerability to revictimization.

As with perpetration, only recently have researchers begun to tease out whether the observed associations between childhood factors and adult victimization persist after adjusting for other negative family factors that could partially account for the link. Findings from discordant twin studies suggest that CSA poses risk for alcohol-related problems beyond risk attributable to family background factors known to contribute both to child sexual abuse and alcohol problems (Sartor, Agrawal et al. 2008). Likewise, a handful of studies confirm that the associations with witnessing and experiencing physical and sexual violence in childhood persist even after adjusting for other family-related stressors (Roustit, Renahy et al. 2009; Chartier, Walker et al. 2010). Nevertheless, many studies to date have failed to control for these possibly confounding factors, making attributions of causality still tentative. Likewise, none of the studies from developing countries that link sexual victimization in childhood and adulthood have controlled for other background stressors.[13]

I have examined sexual revictimization in detail, because it speaks to the question of whether adult sexual assault by nonpartners should most appropriately be modeled as a risk factor for partner violence or as an outcome of shared risk factors. The WHO study clearly demonstrates a strong and consistent association between sexual assault by nonpartners and experience of adult partner violence. But is this association potentially causal, or is it emblematic of a common developmental pathway? My reading of the literature is that both partner and nonpartner sexual assault are likely to evolve from a set of common experiences in childhood and adolescence, rather than partner violence being a risk factor for sexual assault by nonpartners or vice versa. As a result, my pathway diagram does not show an arrow between sexual victimization in adulthood and the experience of violence by an intimate partner.

By contrast, I hypothesize that early first sex, with or without force, is on the casual pathway between childhood abuse and adult partner violence. Studies demonstrate that children sexually abused in childhood are more likely to start sex early and to engage in adolescent risk taking, including problematic alcohol use, delinquency, and risky sex (Fergusson, Horwood et al. 1997); ; (Fargo 2009); (Browning and Laumann 1997) ; (Brown, Riley et al. 2009) (Wilson and Widom 2008); (Black, Oberlander et al. 2009); (Friesen, Woodward et al. 2010). These behaviors in turn place them at higher risk of sexual re-victimization, partner violence, unplanned pregnancies, STIs and HIV (Zierler, Feingold et al. 1991; Boyer and Fine 1992; Dietz, Spitz et al. 1999; Dunkle, Jewkes et al. 2004; Fargo 2009). With the exception of the Dunkle study from South Africa and a household survey in Rakia Uganda, however, these studies all took place in high-income countries (although

[13] Although Jewkes and colleagues (2006) used a version of the Childhood Trauma Questionnaire in their study of partner violence and HIV in South Africa and WHO is currently field testing an international version of the Adverse Childhood Experiences (ACE) questionnaire for use in future studies.

often among disadvantaged populations), suggesting a need to test whether similar pathways operate in low and middle-income settings (Koenig, Lutalo et al. 2003).

Emerging research also suggests that the pathway to reduced educational attainment and risky sexual behavior may not be specific to sexual abuse in childhood, but may represent a more generalized response to early maltreatment or neglect. Indeed a long list of prospective studies demonstrate that sexually or physically maltreated children have lower educational achievement than their nonabused peers, hence the box for low educational attainment in Figure 3.2 is on the pathway to adult partner violence (and dual colored in orange and blue) (Gilbert, Spatz Widom et al. 2009).

3.3 Strength and limitations of existing literature

Despite significant strides in the past 10 years, the existing literature on the determinants of partner violence suffers from a number of important limitations.

The most glaring deficiency is the almost total lack of prospective studies on partner violence in low- and middle-income countries. This makes it extremely difficult to separate those factors that may increase risk of partner violence from those that may be a consequence of abuse. The insights emerging from the studies in Western nations that follow children forward in time have demonstrated the incredible utility of such research for identifying the developmental antecedents of abuse. Until similar studies are completed in the developing world, it is impossible to know the degree to which the development trajectory identified in high-income countries (childhood exposure to abuse → conduct problems → delinquent peers → partnering with others with poor emotional skills → relationship violence), does or does not play a role in the larger problem of partner violence in developing countries.

The major difficulty with existing data from cross-sectional surveys is the large variation in methods used, which makes it difficult to compare findings across studies. Studies vary in terms of the women included (the age range, their partnership status, etc.); the time frame used for inquiring about violence (12 months, 5 years, current relationship, lifetime); the intensity of interviewer training provided, the degree of privacy assured; and most importantly, the definition of partner violence used. Many studies, especially prior to the early 2000s, rely exclusively on "physical assault" as a proxy for abuse, even though partner violence as a phenomenon is considerably more complex. Most include a limited number of potential risk factors and tend to concentrate exclusively either on factors related to the woman or her partner. Few explore the potential interaction between the two or the role that relationship- and community-level factors may play.

Indeed, overall there has been little focus on investigating the possible interaction of factors acting at different levels of the social ecology, or how factors in different historical or cultural environments might influence risk differently. As described in sections 2.4.1 and 2.4.3, recent studies have shown that factors such as woman's employment or participation in credit schemes may be protective in one setting but increase woman' risk of abuse in another (see for example (Koenig, Ahmed et al. 2003). This is an area rich for further exploration.

Finally, the global concentration of studies in advanced market economies has greatly limited researchers' ability to analyze the role that structural, cultural, and normative factors play in the distribution of partner violence. Existing samples have not had sufficient variability to interrogate these factors. As a result, little effort has been made to investigate factors that may account for the vast differences in levels of partner violence between countries or among different populations within a specific country.

This thesis is designed to address some of these research limitations to the extent feasible within the confines of the WHO multi-country study, itself a cross-sectional survey.

Specifically, the thesis aims to fill existing gaps by:

- Using latent class analysis as a data-driven means to identify cases of abuse, allowing cases to be defined by physical, sexual *and* emotionally abusive acts;
- Exploring the patterning of partner violence in Brazil and Peru using multiple different case definitions of abuse, and using these findings to explore a range of conceptual and methodological issues
- Exploring determinants of partner violence across a range of low and middle-income countries, using data that are maximized for comparability;
- Including factors related to the respondent, her male partner, and their relationship when modeling risk and protective factors of abuse
- Utilizing pathway diagrams (presented in this chapter) to guide model building and to test certain hypotheses regarding mediation and moderation of abuse;
- Using ecological modeling to identify factors at both the neighborhood and country level that may influence the geographic distribution of partner violence.

Chapter 4: Overview Of Approach And Methods

This chapter presents an overview of my overall analytic strategy as well as the main methods and data for the analysis. My goal here is to describe the logic and reasoning behind each method and how it fits into the overall arc of my research. I leave discussion of the specific methods and variables to the individual chapters. In the present chapter:

Section 4.1 Provides background on the WHO study, one of the sources of the data used in my analysis

Section 4.2 Describes the use of traditional descriptive techniques and Latent Class Analysis (LCA) to explore the patterning of partner violence in Brazil and Peru

Section 4.3 Describes the use of population averaged generalized estimating equations (GEE) to model individual and relationship level risk factors among abused women

Section 4.4 Describes the data available on violence from the Demographic and Health Surveys (DHS), the second source of data used in the thesis

Section 4.5 Explains ordinary least squares regression and quantile regression as tools to conduct ecological analysis of factors associated with differences in the population level rates of abuse by community and country.

4.1 Background on the WHO Multi-country Study

The WHO Multi-country Study is a population-based, household survey of over 24,000 women ages 15 to 49 in in15 sites in 10 countries (see Figure 4.1). The study was designed to yield comparable data on four main topics:

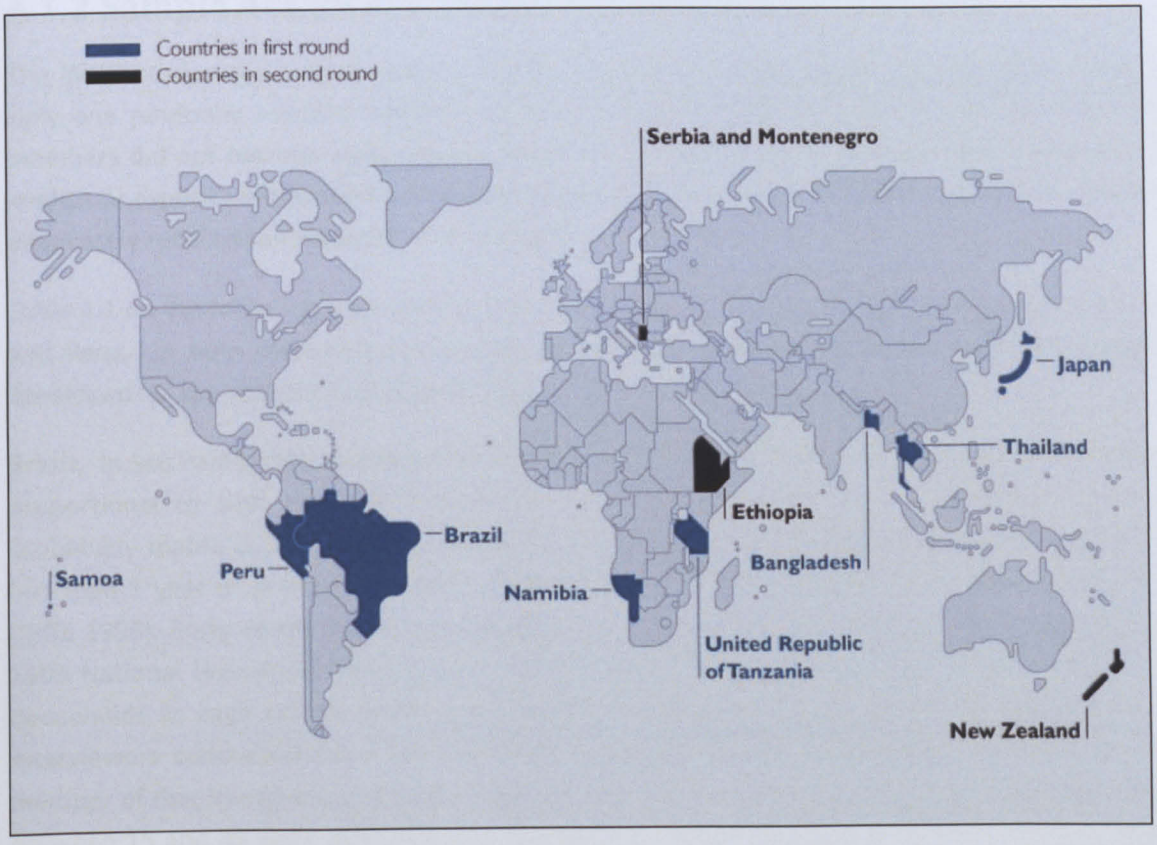
- Lifetime and 12-month prevalence of violence experienced by women from both intimate partners and other perpetrators;
- The consequences of this violence for women's health and well-being;
- Women's coping strategies in the face of abuse; and
- Factors that increase or decrease a woman's risk of victimization.

The study was implemented between 2000 and 2003 by multi-disciplinary teams of researchers and antiviolence experts working in each country, together with a core research team that provided ongoing technical support and oversight of the entire research effort. In my role as one of the five members of the core research team, I helped to design the overall study, write the protocol and study manuals, and develop the questionnaire. Over the course of the study, I also facilitated

investigator meetings, provided ongoing support to the country teams, and assisted with the training the interviewers and piloting of the study in both Brazil and Peru.

I chose to focus the bulk of my analysis on Brazil and Peru for four inter-related reasons. First, as South American countries, Brazil and Peru share certain historical and cultural commonalities, but yield sufficient variation to make comparison interesting. Second, I had the support of the in-country research teams to pursue this work, which gave me access to the data necessary to complete the PhD. Third, Brazil and Peru were the only two countries where I was personally involved in the training of the field workers and the study pilot. Finally, since I wanted to explore how levels of violence varied at a cluster level, I needed countries whose sampling strategy yielded sufficient numbers of clusters at an appropriate size. Brazil and Peru met this requirement

Figure 4.1 Countries participating in the WHO Multi-country Study on Women's Health and Domestic Violence against Women



4.1.1 The WHO Study in Brazil and Peru

In Brazil, the WHO study was conducted by investigators from the Faculty of Medicine and School of Public Health at the University of Sao Paulo, and from the Medical School of the Federal University of Pernambuco. Additional team members came from SOS Corpo, Genero e Cidadania, and from the Feminist Collective for Sexuality and Health, two women's NGOs with extensive experience working with victims of violence.

The Brazil study included population-based household surveys in Sao Paulo, the largest city in Brazil, and in the North-Eastern Province of Pernambuco. At the time of the 2000 census, Sao Paulo city

had a population of over 10 million people with 4 million more living in the greater metropolitan area. In addition to being a regional hub for trade and commerce, Sao Paulo is home to Brazil's many political parties and social movements. Pernambuco is a largely rural province in Northeastern Brazil, with numerous small villages and towns. It is a center for sugar cane production and has a considerable service industry sector.

In Peru, the study was led by investigators from the Centro de la Mujer Peruana Flora Tristan and from Universidad Peruana Cayetano Heredia. It included population-based household surveys of Lima, Peru's capital and largest city, and the Department of Cuzco, a mountainous region in the southeast of the Peruvian Andes. Historically, Cuzco was the seat of the great Inca civilization and today is still home to a large indigenous population. Except for Cuzco city, which is a center for tourism because of its proximity to the Incan ruins of Machu Pichu, Cuzco province is largely rural with many isolated and remote communities.

4.1.2 Sample design and response rates in Brazil and Peru

The WHO study used a multi-stage, cluster sampling scheme to select households for interview. Only one randomly selected woman was interviewed per household to ensure that other family members did not become aware of the nature of the interview. In most cases, investigators used implicit or explicit stratification by an appropriate socioeconomic indicator to ensure that the sample adequately reflected all socioeconomic groups.

Table 4.1 on the following page summarizes the specific sampling strategies employed in both Brazil and Peru. In both instances, statisticians and field workers updated sampling frames originally developed for the country's national census.

Brazil. In Sao Paulo, the selection of sampling units was carried out in three stages, with probability proportional to size: the first involved the systematic selection of 72 census sectors from a probability matrix of 263 sectors, ordered according to the proportion of heads of household with less than 1 year of primary education, drawn up for the 1995 National Household Sample Survey (IBGE 1996). Forty of the 72 sectors had their information updated with the public records of the 1999 National Household Sample Survey (IBGE 2000). In the second stage, a fixed number of 30 households in each census sector were systematically selected and visited by the interviewers. Interviewers conducted short household interviews where they listed every woman who was a member of that household and their respective ages. Once the listing was ready, those women aged between 15 and 49 were identified and one eligible woman per household was randomly selected for interview.

In the Zona da Mata of Pernambuco, the selection of sample units involved four stages: first, the systematic selection of 15 municipalities with probability proportional to size, out of the 42 municipalities, grouped according to demographic density, rate of urbanization and rate of literacy of the heads of the household (IBGE 1991); second, systematic selection in each municipality of a sample of eight sectors, summing up to a total of 118 sectors; third, systematic selection of a sample of 18 households in each census sector and finally, random selection of one eligible woman from each household (Ludermir, Schraiber et al. 2008)

Peru. The Lima sample was built from 166 clusters selected originally by the Instituto Nacional de Estadística e Informática (INEI) to achieve a self-weighted sample with implicit stratification for the five socioeconomic classes that exist in Lima. The research team updated the rosters for the 21,322 households within the selected clusters. In the clusters that had more than 48 households, teams selected 12 households to maintain a minimal interval of four households between interviews. In clusters with fewer than 48 households, a number of households were selected in proportion to the size of the cluster, again respecting a minimal interval of four households. The first household was selected with a random numbers table, after which the households were selected systematically.

Table 4.1 Summary of sampling methods for WHO Multi-country Study in Brazil and Peru

Site	Sampling frame	First (and second) sampling stage	Selection of households
Brazil Sao Paulo	Probability matrix of 263 clusters prepared by Federal Bureau of Statistics (1995) data. Range 100-750 households per cluster	72 clusters systematically selected (PPS) from an ordered list based on literacy rate of heads of households	30 households randomly selected from list of households in each cluster; total 2163 households.
Brazil Pernambuco	All 42 villages and towns in the rural area of the State of Pernambuco	15 villages/towns systematically selected (PPS) from an ordered list by geographic density, urbanization rate and literacy of head of household. In each selected village/town 8 clusters randomly selected	18 households systematically selected in each cluster; total 2136 households.
Peru Lima	Approximately 12,000 clusters in the whole city, determined by National Statistical Institute (INEI). Average 100 households per cluster.	166 clusters systematically selected with PPS from list ordered according to socioeconomic status.	12 households per cluster systematically selected from list of households; total 1992 households
Peru Department of Cuzco	All clusters in each of the two strata: Cuzco town and the rest of department of Cuzco (excluding one inaccessible district, Echarata); each proportionally represented. Average 100-200 households per cluster	Cuzco town; 46 clusters selected with PPS Rest of department: 3 provinces selected with PPS from list ordered on proportion of urbanization. In each province 22 clusters selected with PPS	Cuzco town: 12 households selected systematically from list of households per cluster (total 552 households). Rest of the department for urban clusters: 23 households selected from list of households per cluster. In rural clusters centro poblado randomly selected and 23 households visited from a random starting point (total 518 households). In whole department: total 2070 households

Source: WHO Multi-country Study (World Health Organization 2005)

In Cuzco, separate sampling schemes were devised for Cuzco city and the rest of the department. The department of Cuzco has a highly dispersed rural population spread across 12 provinces. Three provinces outside of Cuzco town were randomly selected with socioeconomic and demographic characteristics that reflect the situation in the department. INEI selected 66 clusters in the three provinces, self-weighted and provided maps of urban areas by block. The research teams made an inventory of all the structures used as households in the blocks and the total number of households in the cluster was divided by 23 (the number of households to be selected). The first house was randomly selected after which the rest were selected systematically.

In rural areas, teams had geographical maps of the selected clusters and the *centros poblados* (household grouped together). The research teams held preparatory meetings with village leaders and mothers clubs and worked collaboratively to construct maps of the households within each cluster. When conducting the survey, the team randomly selected a starting household and visited all households with eligible women. The team moved in a spiral until 23 households with eligible women were approached.

In Cuzco city, INEI updated the registers and 46 clusters were selected, 26 of which already had information on eligible women in each household. A total of 562 households were sampled.

Study teams achieved consistently high household and individual response rates despite challenging field circumstances, especially in rural Cuzco. The overall individual response rate (calculated as the number of completed interviews as a percentage of the number of households with eligible women) was 89.9% in Sao Paulo, 95.7% in Pernambuco, 91.8% in Lima and 96.8% in the department of Cuzco (World Health Organization 2005).

4.1.3 Ensuring data quality and study ethics

The WHO Study team went to extraordinary lengths to ensure the quality and comparability of the data generated. We incorporated state of the art methods to encourage disclosure, including giving women multiple opportunities to disclose; using behaviorally-specific questions to inquire about violence; positioning violence questions late in the interview after rapport is established; and imposing strict rules about conducting the interview in complete privacy. We also implemented a three-week training program for interviewers that built upon lessons learned from members of the International Research Network on Violence against Women (IRNVAW) about how to prepare field workers for interviewing on violence. In addition to standard interviewer training, the course included field visits to local women's shelters, exercises and role plays on gender norms and attitudes, background on stigma and violence, and opportunities for participants to confront their own histories of abuse (Jansen, Watts et al. 2004; World Health Organization 2005).

The team also designed and implemented special ethical and safety guidelines, which WHO subsequently formally adopted for future studies on violence against women (World Health Organization 1999). To ensure the safety and confidentiality, for example, only one woman per household was randomly selected for interview. Each site developed small, easily hidden cards listing local support services that were offered to women at the end of the interview. Where few resources existed, the study teams created short-term mechanisms of support. Ethical approval for the study was obtained from WHO's ethical review group (WHO Secretariat Committee for Research

in Human Subjects), from the ethical review committees of local partner institutions and, where necessary, national ethical review boards (World Health Organization 2005).

4.1.4 Domains of inquiry

The WHO study covered a wide range of topics, with a special emphasis on intimate partner violence. In addition to questions about physical, sexual and emotional abuse by male partners, the study inquired about sexual abuse before the age of 15, witnessing domestic violence as a child, the circumstances of first sex, including whether it was forced, sexual and physical abuse by nonpartners after the age of 15. The study did not ask respondents about their experience of physical abuse, harsh physical punishment, or neglect in childhood, although it did query women about whether their current or most recent male partner was physically abused as a child.

The questionnaire was structured so that early sections collected information on less sensitive issues, with more sensitive topics, including the nature and extent of partner and nonpartner abuse, coming later, after rapport had been established between the interviewer and the respondent. Figure 4.2 summarizes the overall domains included in the WHO questionnaire.

Figure 4.2 Topics covered by the WHO multi-country study

Section	Topic
1.	Characteristics of the respondent and her community
2.	General health
3.	Reproductive health and pregnancy history
4.	Information regarding children
5.	Characteristics of current or most recent partner
6.	Attitudes towards gender roles
7.	Experiences of partner violence
8.	Injuries resulting from partner violence
9.	Impact of partner violence and coping mechanisms used by women
10.	Violence by others (family, acquaintance, strangers)
11.	Financial autonomy
12.	Anonymous reporting of childhood sexual abuse; respondent feedback about interview.

4.1.5 Operationalizing violence in the WHO questionnaire

To measure partner violence, the WHO study used a modified version of the Conflict Tactic Scale, the instrument most widely used globally to estimate levels of partner violence (Straus and Gelles 1979). The original CTS consists of 18 items in hierarchical order that measure different ways of handling interpersonal conflict, starting with a negotiation scale and ending with the most severe forms of physical aggression. The CTS uses behavioral questions about specific acts of violence that do not require the respondent to self-identify as "abused." It asks respondents the frequency of each act, coded on a 6 point scale (from zero times to more than 20 times), and records if the respondent experienced and/or perpetrated the act within the last year, or ever before the last year.

The CTS further subdivides acts of physical aggression into moderate versus severe, based on their likelihood of causing injury (see Table 5-2). Moderate acts include shoving, slapping, or throwing something at one's partner, while severe acts include being hit with a fist or something else that could hurt, being kicked dragged or beaten up, being chocked or burnt on purpose, and being threatened with or actually having a weapon used against them. This distinction has been shown to predict injury in a wide range of settings (World Health Organization 2005).

The WHO study modified the CTS to make it more appropriate for measuring partner violence in nonindustrialized settings. The WHO study added specific questions on sexual violence (an adaptation also subsequently implemented in the revised CTS-2), eliminated the questions on negotiation, and replaced the psychological aggression scale with questions on emotionally abusive acts. In addition, it changed the framing of the questions to avoid implying that all violence occurs in the context of conflict negotiation—a particularly important adaptation given evidence that much violence in the developing world is conceptualized as "discipline." The preamble of the CTS reads:

> No matter how well a couple gets along, there are times when they disagree, get annoyed with the other person, want different things from each other, or just have spats or fights because they are in a bad mood, are tired, or for some other reason. Couples also have many different ways of trying to settle their differences. This is a list of things that might happen when you have differences. Please circle how many times you did each of these things in the past year, and how many times your partner did them in the past year.

The WHO preamble reads:

> When two people marry or live together, they usually share both good and bad moments. I would now like to ask you some questions about your current and past relationships and how your husband/partner treats (treated) you. If anyone interrupts us I will change the topic of conversation. I would again like to assure you that your answers will be kept secret and that you do not have to answer any questions that you do not want to. May I continue?

The WHO instrument also simplified the coding of frequency, asking if each act happened "once," "a few times," or "many times" in last 12 months and if not, if it happened before the last 12 months, and how frequently. Unlike the CTS, which was designed to be coded as a scale with cutoffs for each sub-scale, the WHO instrument was constructed to yield dichotomous measures of emotional, physical and sexual violence that could be further subdivided by time frame and frequency.

Table 4.2 summarizes the full set of questions the WHO questionnaire used to capture information on violence. It includes questions on partner violence, as well as the questions on child sexual abuse, violence by nonpartners after the age of 15, and forced first sex. For the purposes of analysis, the WHO study defined a "case" of partner violence as any ever-partnered woman who had experienced one or more acts on the physical and/or the sexual violence since the age of 15. Current violence included women who experienced physical or sexual violence by a partner within the last 12 months.

Table 4.2 Questions on violence in the WHO multi-country study

Physical violence by partner

Moderate violence

- Was slapped or had something thrown at her that could hurt her
- Was pushed or shoved

Severe violence

- Was hit with a fist or something that could hurt
- Was kicked, dragged or beaten up
- Was choked or burnt on purpose
- Partner threatened to use or actually sued a gun, knife or other weapon against her

Sexual violence by partner

- Was physically forced to have sexual intercourse when she did not want to
- Had sexual intercourse when she did not want to because she was afraid of what he might do
- Was forced to do something sexual that she found degrading or humiliating

Emotionally abusive acts by partner

- Was insulted or made to feel bad about herself
- Was belittled or humiliated in front of other people
- Partner had done things to scare or intimidate her on purpose (e.g. smashing things, look at her menacingly)
- Partner had threatened to hurt someone she cared about

Controlling behaviours by partner

- Tried to keep her from seeing friends
- Tried to restrict her contact with her family
- Insisted on knowing where she was at all times
- Ignored her or treated her indifferently
- Expected her to ask permission before seeking health care for herself
- Was often suspicious that she was unfaithful
- Got angry if she spoke with another man

Physical violence by others since 15

- Since the age of 15, has someone other than her partner ever beaten her or physically mistreated her
- Question includes probes about different potential categories of abusers (friend, family member, employer, stranger, etc) and records frequency of each act

Sexual violence by others since 15

- Since age 15, has someone other than a partner forced her to have sex or to perform a sexual act when she did not want to
- Question includes probes about different potential categories of abusers (friend, family member, employer, stranger, etc) and records frequency of each act

Forced first sex

- How would she describe the first time that she had sex. Would she say that she wanted to have sex; she did not want to have sex but it happened anyway; or she was forced against her will to have sex.

Child sexual abuse

- Before the age of 15, did someone in her family ever touch her sexually or make her do something sexual that she didn't want to do.
- Question includes probes for other categories of non-family abusers and records the age at which it happened, its frequency and the age of the abuser.

4.1.6 Violence exposure table

The WHO questionnaire also included a violence exposure table that provides further details about each relationship that a woman has had, including:

1. The month and year the relationship started
2. When the relationship ended
3. Whether or not that partner physically or sexually mistreated her
4. The month and year of the first incident
5. The month and year of the last incident

This information becomes critical in subsequent analysis, because the exposure table establishes whether a woman has experienced violence from more than one partner and whether the violent partner refers to her current or most recent partner. Where abuse was from a previous partner, the information she provides on current or most recent partner will not relate to her violent partner.

4.2 Methods for Chapter 5 (patterning of partner violence)

Objective 1: To examine the patterning of distinct types of partner violence in Brazil and Peru using both the WHO case definition of partner violence and latent class analysis

4.2.1 Descriptive analysis

I began with simple descriptive analysis using the standard WHO outcome and explanatory variables used in the WHO Multi-country Study, I generated simple frequency tables describing the sample of the women in each setting according to age, education, socioeconomic status, number of children, partnership status and whether or not she earned an income. The frequency of various different types of partner violence was analyzed by severity and time frame (current versus former) and the overlap between different types of partner and nonpartner violence explored through flow charts and proportional Venn diagrams.

In addition, I examined the relationship between controlling behaviors and various types and combinations of violence to explore whether control should most appropriately be conceptualized as a constituent part of abuse (as argued by Johnson) or as a risk marker for partner violence.

4.2.2 Dealing with missing values

With the exception of the questions on gender norms, acceptance of violence and partner's education, most variables had fewer than 1% missing values. In Peru, variables for gender norms and acceptance of wife beating were incomplete for 6% and 10% of cases respectively, and in Brazil, partner's educational attainment was missing for 17% of cases. For the purposes of descriptive analysis, I included only cases with complete data. When conducting statistical modelling, however,

I checked my final models using multiple imputation to compensate for values that were missing at random. The noncorrected and imputed models yielded very similar results.

The missing data literature distinguishes between data that are (1) missing completely at random (where there is no systematic difference between the missing data and the observed data), (2) missing at random (where there is a systematic difference between the missing and observed data that can be explained by the observed data); and (3) missing not a random (where there are systematic differences between the missing and observed data and there is no way to predict the missing data from observed values) (Sterne, White et al. 2009).

Traditional approaches for dealing with missing data—such as substituting the mean or the last value observed—are generally inadequate solutions that can introduce bias. All single imputation techniques, for example, usually generate standard errors that are too small, because they fail to account for the uncertainty around the missing values. By contrast, multiple imputation allows one to use all variables, "filling in" for values deemed missing at random, thereby yielding analyses that are statistically more powerful and less biased than can be achieved by analyzing complete cases.

The multiple imputation technique incorporated into STATA's *ice* command (version 10.0) uses multiple imputation by chained equations (mice), an interactive multi-variable regression technique that is suitable for a non-monotone missing data patterns. (Missingness is said to be nonmonotone, when models for the missingness of one variable may include covariates which are also missing values) (Horton and Kleinman 2007). For each incomplete variable the user chooses a set of explanatory variables that will be used for imputation. Each missing value is replaced by several (m) values, thus producing m imputed data sets. The differences between these data sets reflect the normal uncertainty of the missing values. Each imputed data set is then analyzed as if it were a complete data set, using standard procedures. The m resulting analyses are then combined into one final analysis, generating both an unbiased estimate of effect and the variance around it (Harel and Zhou 2007).

Multiple imputation can help address data that are "missing at random." However, it cannot correct for bias in data "missing not at random."

4.2.3 Defining a "case of abuse" using latent class analysis (LCA)

I used latent class analysis to identify different categories of abuse and to assess their prevalence in each of my four study areas. LCA is a statistical method for finding subtypes of related cases from categorical data. LCA defines cases by the criteria of "conditional independence"—that is, within each latent class, each variable is statistically independent of every other variable (Collins and Lanza 2010).

The notion behind LCA is that it is possible to divide the population into several clusters that are distinctive in terms of some underlying phenomena (the latent class) that can be measured indirectly by answers to questionnaire items. In the context of this thesis, the latent classes are women who may or may not be subject to different types of partner violence. The indicator questions are the questionnaire items measuring physical, sexual and emotionally abusive acts (Watson and Parsons 2005).

LCA can reveal underlying heterogeneity in a construct such as "abuse." It does so by cross classifying different violent acts and then examining the degree to which particular combinations of acts (item response patterns) appear together in a particular relationship (Macmillan and Kruttschnitt 2005). Unlike direct classification of respondents based on whether or not they have experienced a specific act, LCA does not assume that the questionnaire items are perfect measures of the underlying concept. Some of what may be captured by a question on pushing or shoving, for example, may actually constitute playful behaviors between couples that have a minor, or no, negative impact. LCA makes use of the co-occurrence of the items to test this assumption (Watson and Parsons 2005).

LCA estimates two types of probabilities: latent class probabilities, and a conditional (or item response) probability. Latent class probabilities provide information on the proportion of the population associated with each latent class. Conditional (or item response) probabilities are derived for each response item (r_j) within each measured indicator variable (j) conditional on being within a latent class. Item response probabilities measure the degree of association between each response item and each latent class.

More formally, LC analysis assumes that there is a latent variable X with T latent classes. Each observation is a member of one of the T latent classes. It also assumes that local independence exists between the measured variables—that is the measured variables are mutually independent of each other, conditional on their latent class membership.

As Vermunt and Magidson observe, this model can be expressed using (unconditional) probabilities of belonging to each latent class, and conditional response probabilities as parameters. For example, in the case of four nominal manifest (measured) variables A, B, C, and D we have:

$$\pi_{ijklt} = \pi_t^x \pi_{it}^{A/X} \pi_{jt}^{B/X} \pi_{kt}^{C/X} \pi_{lt}^{D/X}$$

where π_i^t denotes the probability of being in latent class t = 1, 2, ... T of latent variable X; $\pi_{it}^{A/X}$ denotes the conditional probability of obtaining the ith response to item A, from members of class t, i =1,2, ... I. The symbols $\pi_{it}^{A/X} \pi_{jt}^{B/X} \pi_{kt}^{C/X} \pi_{lt}^{D/X}$, (j = 1,2 ..J; k = 1,2... K; l = 1,2 ... L) denote the corresponding conditional probabilities for items B, C and D, respectively (Vermunt and Magidson 2006) The parameters (probabilities) are estimated using maximum likelihood techniques. After defining the latent classes, individuals are assigned to their most likely latent class based on their probability of membership, and thus individuals with identical response patterns are assigned to the same latent class.

For the current project, I used Latent Gold, one of a number of commercially available statistical packages developed for conducting latent class analysis (Vermunt and Magidson 2006). With this program, you enter any number of indicator variables—questions that relate to the underlying construct—and model a range of potential grouping patterns (e.g. one, two, three or four classes of IPV). You have an option to restrict certain answer patterns to a known cluster if there is a theory-driven reason to do so. For example, you could restrict to class I women who have never experienced any physical or sexual abuse. The program then generates a number of model solutions

that must be assessed both for conceptual clarity, interpretability, and statistical "goodness of fit" (Collins and Lanza 2010).

4.2.4 Assessing model fit for LCA

The model L^2 statistic (likelihood ratio chi squared statistic) is one of several statistics that can be used to assess how well the model fits the data (i.e. how similar model-based response frequencies are to observed frequencies). In the context of latent class analysis, L^2 can also be interpreted as indicating the amount of the observed relationship between the variables that remains unexplained by a model; the larger the value, the poorer the model fits the data and the worse the observed relationships are described by the specified model.

Thus, when testing model fit, one is looking for a relatively low L^2 value, and a p value > 0.05. The associated p-value is a formal assessment of the extent to which the model fits the data (the null hypothesis of this test is that the observed and predicted values are close—in other words that the specified model holds true for the population). Thus, $p<0.05$ indicates that you can reject the null hypothesis, thereby suggesting poor model fit.

Among models that provide an adequate fit for the data (for which the p-value is greater than 0.05), generally the one that is most parsimonious (fewest number of parameters -- Npar) is preferred (Vermunt and Magidson 2006).

When dealing with a small sample size or sparse data, however, the chi-square does not provide a good approximation to L^2 and hence the *p*-value reported is not valid. Thus, Latent Gold provides an alternative option for assessing model fit by using the *bootstrap* of L^2 to estimate the p value. This provides a more precise estimate by relaxing the assumption that the L^2 statistic follows a chi-square distribution. Latent GOLD then performs 500 iterations to estimate the *p*-value.

When two models meet initial criteria for model fit, it is possible to test whether adding an additional latent class substantially improves model fit. Latent Gold uses conditional bootstrap to perform this test, using Log Likelihood (LL). If the estimated *p*-value associated with the increase in classes is < 0.05, then it means that the increase in classes *does* provide a significant improvement in model fit over the model with fewer classes (Vermunt and Magidson 2006).

The Bayesian Information Criteria[14] (BIC) statistic is a less computationally intensive approach to assessing relative model fit. Information Criteria compare competing models in terms of the balance between fit and parsimony. When comparing among suitable models, the model with the lowest value (i.e. the most parsimonious) is preferred.

A final indicator useful for assessing the statistical adequacy of a model is entropy. Entropy is a measure of the certainty of the assigned class membership and varies from 0 to 1. Values closer to

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[14] BIC= q log(N) – 2 log L where q is the number of model parameters, N is the number of observations and L is the likelihood function.

one indicate less classification uncertainty. Classification error compares the distribution of cases observed to that expected under the model. Generally, one hopes to see classification error less than 20%. If relative entropy and classification error are within acceptable ranges (entropy close to 1 and classification error < 20%) then it is possible to treat cluster allocations as finite variables. Otherwise it is necessary to continue to use the underlying conditional probabilities when using the latent classes as an outcome variable (Clark and Muthen 2009).

In addition to statistical fit, it is essential that the model be evaluated for its "fit" and interpretability in light of current knowledge and theory. There may be more than one solution that fits the data adequately from a statistical standpoint. Final choice of models should be based on subject matter knowledge and theory. For my analysis I used the bootstrap *p* value, the Baysian Information Critiera (BIC), and entropy as my primary statistical measures for model fit.

4.2.5 Advantages of the latent class approach

LC analysis offers a number of advantages over traditional approaches to defining cases of partner violence. First, it provides a data-driven way to explore whether women who have experienced violence tend to cluster in a way that can reveal distinctions in "type" or severity of abuse. It also allows one to explore *how* cases group and which answer patterns fall into the same cluster—findings that might suggest hypotheses about the underlying phenomena in question. Second, the latent class approach better approximates how most women actually experience partner violence—not as isolated events, but as a constellation of different forms of abuse over time. Failure to capture this reality has been one of the longstanding critiques of the conflict tactic scale (Smith, Smith et al. 1999).

As described in Chapter 1, traditional approaches to defining partner violence have generally enforced strict boundaries between acts of physical, emotional and sexual violence, and have used a priori criteria for defining what will and will not be considered a "case." Definitions have ranged from any act of physical and/or sexual violence (the definition used in the WHO study) to more complex definitions that incorporate elements of the act's severity, frequency or impact (for example, see (Watson and Parsons 2005).

Moreover, very few studies have integrated psychological or emotional acts into their case definition of "abuse," despite the fact both women and men frequently identify the psychological aspects of violence as the most damaging. For example, when asked to identify the "worst" aspect of the abuse they reported, almost half of all respondents (men and women) in a national study on domestic violence in Ireland, listed an emotional incident or groups of incidents as being the worst (generally over and above physical or sexual violence) (Watson and Parsons 2005). Likewise in a US study of women with a history of battering, 72 per cent reported that they considered the psychological abuse they endured more devastating than the physical abuse (Arias 1999).

To overcome these limitations, I used indicator questions that address multiple aspects of abuse, including physical and sexual assault, threats, and emotional abuse.

4.3 Methods for Chapter 6 (individual model)

Objective 2:. To identify and model individual- and relationship-level factors that increase or decrease the odds that a woman will experience partner violence, with a special emphasis on her risk of experiencing severe abuse.

The ultimate motivation behind most research into risk and protective factors is to generate data useful for guiding potential interventions at the individual and population level. An essential analytic starting point is to decide if one's primary objective is to generate the best predictive model possible to identify individuals at heightened risk of abuse, or to develop an explanatory model that can help elucidate possible causal pathways that may be amenable to prevention interventions. An excellent predictive model, for example, can be extremely useful for developing screening programs. Factors need not be "causes" of partner violence to be highly predictive of who may be a likely victim or perpetrator. For example, prior arrest for a violent offense might be highly predictive of perpetrating future violence, but that does not mean that the arrest "causes" the violence.

But if the goal is to develop an explanatory model, the modelling strategy must begin with a strong conceptual model outlining the hypothesized causal relationships among variables.

Since my goal is explanatory, my modelling strategy has been strongly guided by the conceptual frameworks presented in Chapters 2 and 3. Clearly, the nature of cross-sectional data prohibits one from drawing conclusions about causes, but it is nonetheless important to have well conceptualized assumptions about the hypothesized relationships among variables when making decisions about potential confounders and which variables to include in a model.

4.3.1 Dealing with the clustered nature of the data

Because the WHO study used multi-stage cluster sampling, individuals within each cluster are more likely to be similar than individuals from other areas—both in terms of their answers to questions and to their underlying health status. In other words, observations drawn from clustered data are not independent. Ignoring this dependency in a model could lead to incorrect tests of significance, confidence intervals that are too small, and biased effect sizes, all of which can lead to incorrect interpretation of the association between variables (Zyzanski, Flocke et al. 2004).

There are a number of ways that one can deal with clustered data, each having different consequences (see Table 4.3). Demographers tend to use the svy commands in Stata which incorporates the effect of clustering and stratification as well as allowing for sampling weights when computing the variance, standard error, and confidence intervals. Another option is to artificially inflate the standard errors using a so-called sandwich estimator for the error, yielding robust standard errors. Both of these approaches deal with the technical problem presented by clustering but they do not allow one to assess the degree of between-group variation.

Moreover, both approaches rely on the underlying assumption that the cluster-level effect of a variable is the same as the effect at the individual level. If the association between the exposure and outcome is different at the two levels, however, then the coefficient from a model that ignores

clustering will be biased towards the cluster level effect. Instead one must model the clustered structure explicitly.

One option is to include a dummy variable for each cluster and to model the cluster coefficients as a fixed effect. When the number of clusters is large, however, this leads to a model with a very high number of parameters.

Table 4.3 Alternative analysis strategies for hierarchical data

Strategy	Consequence
Fit a single-level model and ignore structure	Substantively you would not measure the importance of context. Technically, your standard errors would be too small, leading to incorrect inferences (concluding that effects that might be ascribed to chance are "real", i.e. a high risk of Type I error).
Include a set of dummy variables for groups (a fixed effects model)	Group is treated as a fixed classification, so the target of inference is restricted to the groups represented in the sample. If the number of groups is large, there will be a large number of additional parameters to estimate. The effects of group-level explanatory variables cannot be estimated simultaneously with group residuals.
Fit a single-level model with group-level explanatory variables	High risk of Type I errors because standard errors of coefficients of group-level explanatory variables may be severely underestimated. No estimate of the between-group variance that remains unaccounted for by the included group-level explanatory variables.
Correcting standard errors for design effects, or fitting a marginal model (population average model) in which the dependency is modeled directly	The standard errors will be correct (properly adjusted for clustering), but unable to assess the degree of between-group variation.
Multilevel modeling (random effects)	Correct standard errors and an estimate of between-group variance.

Source: LEMMA (Learning Environmnet for Multilevel Methods and Applications, University of Bristol on-line course, available at htt://www.cmm.bris.ac.uk.

Another approach is to treat clusters in the sample as a random sample of a larger population of clusters such that the coefficients for the effect of cluster vary randomly around an overall mean. In this case, the cluster-level effect is modelled as "random" and each cluster is allowed to have its own specific effect on the outcome that all its members share. This approach, also known as "multilevel" modelling, has become increasingly common in public health over the last several decades.

Multilevel models allow the simultaneous examination of the effects of group and individual-level variables on individual level outcomes, while at the same time accounting for the correlation of observations within groups (Diez Roux and Aiello 2005). As Diex Roux and Aiello observe, "By bringing together group- and individual-level variables and examining variability both within and between groups, multilevel analysis avoids the inferential fallacies that may occur when a relevant level is ignored."

A final approach, and the one I have chosen for my thesis, is to rely on marginal models , also known as population average models, using Generalised Estimating Equations (GEE). Population-average models account for correlation between lower and higher level units by modelling the correlations or covariances themselves rather than by allowing for random effects or random coefficients, as in multilevel models (Diez Roux 2002). They are an improvement over robust standard errors because they also take into account clustering in the data when estimating the effect measure (e.g. odds ratio, rate ratio).

Both GEE models and multilevel models can adequately handle hierarchically structured data, although they do so in different ways, using different mathematical strategies. The drawback of GEE models is that they treat cluster level (or group two level) variation as a nuisance factor and do not allow one to decompose unexplained variability among levels (an advantage of multilevel models).

Significantly, when modelling categorical variables, the multilevel and GEE techniques estimate subtly different parameters. In multilevel models, fixed effect parameters estimate the cluster-specific effect of a covariate on an outcome (e.g. partner violence) whereas the GEE parameter estimates the marginal effect of a covariate on the population from which the data are drawn (hence the term population average model). Expressed another way, random effect models estimate cluster specific odds ratios—that is the average change in odds for individuals in that cluster, given a change in exposure from one value to another. GEE models (also known as marginal models) estimate the expected difference within a population of a given change in everyone's exposure from one value to another (Hubbard, Ahern et al. 2010).

When calculating odds ratios of rare outcomes, these two values are largely equivalent; but when dealing with common outcomes that vary considerably between clusters (such as partner violence), the GEE parameter and the fixed effect parameter from a multilevel model can diverge significantly. This is due to what is known as the "non-collapsibility" of the odds ratio (Greenland, Robins et al.

1999).[15] Formally, a measure of effect or association is "non-collapsible" if its stratum specific effects are not equal to its marginal effects, as is the case with the odds ratios of common outcome. Conceptually, it can be explained as follows: If you have a population of individuals with varying risk of outcome Y and you double everyone's risk, you will double the average risk in that population. If you double everyone's odds, however, you do *not* double the average odds in the population—hence the importance of distinguishing between cluster-specific and population average odds ratios.

Given that I expect partner violence to be a common outcome in the settings I am studying, I have chosen to use population averaged, marginal models as my modelling strategy.

4.3.2 Modelling strategy

My analytic strategy began with my revised ecological model. I identified which of the factors associated with partner violence in the literature I could reasonably evaluate using data from the WHO study. Because the WHO study had been designed based on the 1998 version of the ecological framework, many (but not all of the potentially relevant variables) could be tested. I explored the factors associated with the *lifetime* experience of partner violence at a bi-variable level (adjusted for age), comparing the factors that emerged as relevant to partner violence as defined by the WHO case definition (physical or sexual violence; IPV-WHO hereafter) versus partner violence subtypes as defined by latent class analysis. The goal here was to assess whether there are differences in the risk factors or their direction and size of effect, according to the case definition of abuse.

Next I developed a multi-variable model of the risk and protective factors associated with women's individual odds of experiencing lifetime partner violence. Guided by my conceptual framework, I proceeded in stages, beginning with factors related to the early life course of the woman and her partner (e.g. experiencing physical or sexual abuse, witnessing domestic violence as a child); next developing separate models of factors relevant to the current situation of the woman and the man; and finally exploring a block of factors (such as marital conflict, and couple communication) related to the couple's relationship.

Eventually, I combined the models, adding each set of variables in as separate blocks beginning with the childhood factors, adding the respondent and partner factors, and concluding with the relationship factors. At each point, I analyzed the impact of that each new set of variables had on the point estimates and significance of variables already in the model, checking for confounding and possible mediation.

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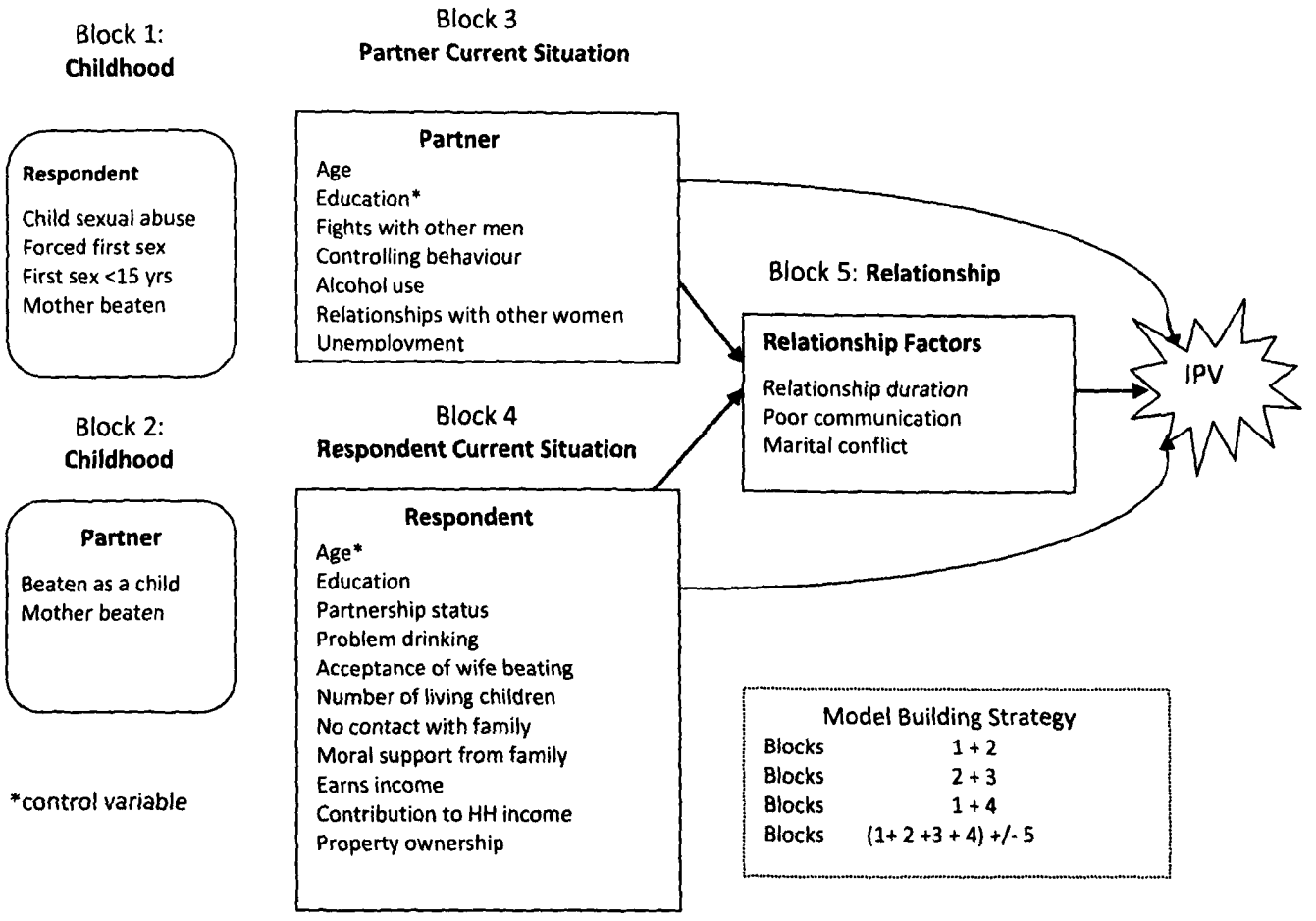
[15] A measure of effect or association is "non-collapsible," as understood here, if stratum-specific effects are not equal to marginal effects, as is the case with the odds ratios of common outcomes.

Figure 4.3 Model building strategy



4.4 Methods for Chapters 7 and 8 (ecological analysis)

Objective 3: To explore community- and macro- level variables that are associated with the population-level distribution of partner violence across geographic settings.

As British epidemiologist Geoffrey Rose observed in his now classic article, "Sick Individuals and Sick Populations," the determinants of variations between individuals within a population may be different from the determinants of variations between populations (Rose 1985). Applying the population perspective to violence research means asking, "Why does this population have this particular level and distribution of partner violence?" in addition to, "Why did this particular woman get beaten?"

To pursue this question I conducted two separate ecological analyses. The first evaluated the associations between cluster-level mean values of key explanatory variables and the average prevalence of partner violence within that cluster (Chapter 7). The second (Chapter 8) explores associations between potential macro-level determinants and the prevalence of partner violence across 40 mostly low and middle-income countries.

4.4.1 Source of data for ecological analysis

For Chapter 7, I used data from the WHO study from Brazil and Peru to examine what cluster-level factors are related to the geographic distribution of partner violence at the neighborhood level. This approach relies on cluster-level means as a proxy for neighborhood-level processes. The choice of variables to include was informed by my review of the literature and the ecological model. By generating cluster-level variables by aggregating individual-level response, I ensure that both levels of response are referring to the same time period.

In Brazil, the WHO study had 72 clusters in Sao Paulo and 118 clusters in Pernambuco. Peru had 166 clusters in Lima and 110 in Cuzco province (with 44 clusters in Cuzco city and 22 clusters drawn from each of 3 districts). When conducting ecological analysis, the sample size (n) becomes the number of clusters, rather than women, thus I had to be judicious in deciding on the explanatory variables to include in the model so as to avoid sparsely filled cells.

In Chapter 8, I examined the impact of macro-level factors on the geographic distribution of partner violence across countries. To do so, I used additional sources of data both for the prevalence of partner violence and for access to relevant information on potential explanatory variables at the macro level. For the purposes of my outcome variable (physical or sexual violence by an intimate partner) I was able to combine data from the WHO study with similar data from a series of Demographic and Health Surveys (DHS surveys) that have fielded a special module on domestic violence first introduced in the late 1990s.

The DHS are large population-based surveys implemented by countries every 3 to 5 years with financial assistance from donor countries. Originally they focused largely on the proximate determinants of fertility, family planning knowledge, and contraceptive use but more recently, their remit has expanded to include a wide range of health topics. In the late 1990s, I helped develop and field test a specialized module on partner violence for use in the DHS. I also helped craft and lobby for special requirements related to interviewer training, privacy and ethics that became required for countries interested in implementing the domestic violence module. With some small exceptions, the questions on partner violence and the acceptability of wife abuse used in the DHS mirror those used in the WHO Study. For the ecological analysis I present in Chapter 8, I combined data from the DHS with data from the WHO study to explore the association between different macro- level factors and the population prevalence of partner violence by site and by country.

For my explanatory variables, I used data broken down by urban and rural and aggregated at the site or country level from the DHS and the WHO studies. I also relied on a number of large data sets compiled by the World Bank, the United Nations, and various different social science academics and institutions. When selecting explanatory variables from outside data sets (as opposed to aggregating individual responses from the WHO or DHS surveys at a cluster level), I used data from the closet year available to the violence survey dates, giving preference to data collected prior to the time the violence data were collected. In almost all cases, data on the explanatory variables were collected within two years of the date of the violence survey. Detailed information on the specific sources of each explanatory variable and information on how I made the DHS and WHO violence outcome measures comparable are provided in Chapter 8.

Additionally, I used multiple imputation with chained equations to impute missing exposure variables.

4.4.2 Regression analysis

For Chapters 7, I used linear regression to analyse the association between factors at the neighborhood (cluster) level and the cluster-level mean prevalence of partner violence.

I began by aggregating select explanatory variables at a cluster level (e.g. proportion of women who completed secondary education), and developing a correlation matrix between these variables and the mean proportion of women who had experienced physical or sexual partner violence by an intimate partner while living within that cluster. (More detail on the construction of variables is provided in Chapter 7). I also checked for outliers and examined the normality of my variables using scatterplots and histograms by site.

Then I used ordinary least squares (OLS) regression to estimate the effect of multiple explanatory variables on the mean level of partner violence within each cluster. Various different assumptions strongly affect the validity and robustness of analysis using OLS. These include:

Linearity. At the name implies, linear regression assumes that the relationship being modelled is linear—an assumption that can be tested using bi-variable scatterplots of the dependent and explanatory variables;

Normality. Multiple regression likewise assumes that the residuals (predicted minus observed values) are distributed normally (i.e. follow a normal distribution). This can be tested by producing histograms for the residuals or creating normal probability plots.

No multicollinearity. Multicollinearity occurs when the explanatory variables are highly correlated (generally 0.90 or greater). Multicollinearity does not result in biased coefficient estimates but it does increase the standard error of the estimates and therefore reduces the degree of confidence one can place in them. It can be assessed by examining a correlation matrix and by measuring the Variance Inflation Factor (VIF). VIF is a measure of the influence of one explanatory variable on all other explanatory variables. A VIF>10 suggests that multicollinearity may be present and if VIF>100, there is certainly multicollinearity in the sample (Chen, Ender et al. 2003).

Homoscedasticity. Homoscedasticty means that the variance of errors is the same across all levels of the explanatory variable. This assumption can be checked by examining a plot of the residual values versus the fitted (predicted values). According to Berry and Feldman (1985), slight heteroscedasticity has little effect on significance tests; however, when heteroscedasticity is marked, it can seriously distort the findings and weaken the analysis (Berry and Feldman 1985).

Omitted variable bias. Any variable omitted in a regression becomes part of error term. This can lead to a situation where the basic assumption of independence between explanatory variables and the error term is violated.

At a cluster level, the mean prevalence of partner violence follows a relatively normal distribution making least squares regression an acceptable method for data analysis. I ran post-estimation tests to ensure that my data conformed to the basic assumptions of this method.

In addition, linear regression requires an adequate number of observations. Most authors recommend that you should have at least 10 to 20 times as many observations (cases, respondents, clusters) as you have variables; otherwise the estimates of the regression line become unstable and unlikely to be replicated if the study were conducted again.

For Chapter 8, I chose to use quantile regression rather than linear regression to explore the association between macro-level factors—such as the proportion of women completing secondary school and inequality in family law—and the proportion of women who have experienced partner violence within the last 12 months, across a range of 40 different countries.

Quantile regression uses the median (or any other percentile range) rather than the mean to describe the relationship between the response variable (prevalence of partner violence) and various explanatory variables (Hao and Naiman 2007). As a result, it can be applied in cases where the response variable is highly skewed, as is the case with the prevalence of partner violence across countries. Also, because it can model various different quantiles of the response variable as they relate to covariates, quantile regression is especially useful when examinining social issues where the impact of a covariate may differ at different ends of a distribution. For example, investigators can use quantile regression to explore whether the impact of poor maternal nutrition is different among extremely low birthweight infants versus normal weight infants.

In linear regression, the regression coefficient represents the change in the response variable produced by a one unit change in the explanatory variable associated with that coefficient. The quantile regression parameter estimates the change in a specified quantile of the response variable produced by a one unit change in the explanatory variable (Despa 2007).

In Chapter 8, I used quantile regression to model the 0.20, the 0.50, and the 0.80 quantiles of current partner violence as a function of the covariates.

Chapter 5: Exploring The Patterning Of Partner Violence In Peru And Brazil

Guiding questions

1. What is the nature and patterning of lifetime partner violence in Brazil and Peru? How do different forms of violence inter-relate?
2. How do cases of violence identified through Latent Class Analysis compare to those using case definitions from the WHO study?
3. Do the violence types identified through LCA differ in terms of either health outcomes or risk and protective factors?
4. How do the LCA categories relate to controlling behavior, and what does this imply about whether controlling behavior is a risk factor or a defining element of partner violence?
5. What does the above analysis suggest about the possibility of there being different subtypes of partner violence in Brazil and Peru?

5.1 Background

The goal of this chapter is to examine the patterning of distinct types of partner violence in Brazil and Peru using both the WHO case definition of lifetime partner violence (IPV-WHO) and latent class analysis (LCA) as an alternative method for identifying potential subtypes of violent abuse. In addition to revealing potentially interesting insights into the nature of abuse in these countries, the strategy of using both approaches on the same data set allows one to evaluate the potential added utility of latent class analysis as a means of defining cases of abuse. The reigning strategy defines cases by whether or not the respondent has experienced one or more acts of a particular type of aggressive act (physical violence, sexual violence, emotional abuse) within their lifetime or a given time period (Straus, Hamby et al. 1996; Schwartz 2000; World Health Organization 2005). More recently, some investigators have moved toward definitions that require more than one violent event to qualify as abuse, arguing that partner violence is a pattern of behavior not an isolated event (Pallitto and O'Campo 2005; Jewkes, Dunkle et al. 2010).

As described in my literature review, a number of researchers have also begun to use latent class analysis to define partner violence and to identify potentially meaningful subclasses of the abuse phenomenon (Walby and Allen 2004; Watson and Parsons 2005; Ansara and Hindin 2009). This chapter builds upon this emerging tradition and extends it in several significant ways.

Specifically, the chapter:

1. Represents the first effort to use LCA to identify subtypes of partner violence in countries outside of Canada, the United States and Northern Europe;
2. Pilots an approach to LCA that uses indicator variables that combine data on the frequency and severity of violence, together with information on the specific acts experienced;

3. Examines the degree to which the typologies that emerge in Brazil and Peru are consistent with those that emerge in two other African settings (Namibia and Ethiopia), using comparable data.
4. Explores (to the extent feasible) whether controlling behaviors are most appropriately conceptualized as a risk factor for partner violence or as a constituent part of the phenomenon; and
5. Provides a preliminary exploration of the degree to which the classes identified by LCA differ in terms of their risk factors or their effect on important health outcomes.

The chapter begins by describing how cases are defined in the WHO study and then describes how I created the indicator variables used to generate alternative case definitions using latent class analysis. The chapter goes on to present descriptive information on the sample and to examine the patterning of partner violence using the traditional WHO violence definitions. Section 5.3.4 describes the process of deriving cases of partner violence using LCA and Section 5.3.5 compares cases as derived from the WHO definitions with those derived through LCA.

5.2 Methods

5.2.1 Construction of WHO violence variables for descriptive analysis

Case definition. As described in Section 4.1.4, the WHO study defines a "case" of partner violence as any woman who has experienced one or more acts of physical or sexual violence by a current or previous partner (IPV-WHO) since the age of 15.

Prevalence is expressed as the number of cases divided by the number of ever-partnered women (i.e. those potentially exposed to partner violence in their lifetime). When conducting bi-variable and multi-variable analysis, the WHO study uses currently or previously partnered women who have never experienced physical or sexual partner violence as its reference category. While this reference group will not have experienced partner violence, they may have experienced other types of violence, such as emotional abuse by a partner, child sexual abuse, or violence by someone other than an intimate partner.

Severe physical violence. As noted previously, the CTS defines physically aggressive acts as either moderate or severe by virtue of their likelihood of causing injury (Straus, Hamby et al. 1996). Women who have experienced any act of "severe" violence are coded as a case of severe violence, even if they experienced other acts of moderate violence. Women who experience *only* moderate acts of violence are coded as cases of "moderate violence."[16]

[16] This way of constructing cases has been shown to correlate strongly with the risk of physical injury in all sites of the WHO study (World Health Organization 2005).

Emotional abuse and controlling behavior. The WHO study also includes three questions on emotionally abusive acts and seven on controlling behaviors by partners. The WHO study team decided not to include emotional abuse in its prevalence estimates of partner violence because less is known about how to interpret emotional abuse across cultures. However, it did report the prevalence of specific emotionally abusive acts and specific controlling behaviors (World Health Organization 2005).

The proper distinction between emotionally abusive acts and controlling behaviors is a matter of some controversy in the literature. Many of the scales and instruments developed to measure emotional and psychological abuse, for example, include items that could be construed as controlling behaviors (e.g. he made her account for her whereabouts at all times) (Follingstad 2007). Some researchers have even combined the WHO survey's four emotional abuse questions (s704a-s704d) and its six controlling behavior questions (s703a-s703g) into a single "emotional abuse" measure, implying that both sets of questions tap the same underlying phenomenon (Yoshihama, Horrocks et al. 2009).

To assess whether the controlling behavior questions (s703a-s703g) should be analyzed separately from the emotional abuse questions (s704a-s704d), I used principal axis factor analysis with varimax rotation. Factor analysis allowed me to examine whether the emotional abuse and controlling behavior questions loaded on one or more than one underlying factor. Based on these findings (reported in the results section), I created variables for emotional abuse and a controlling behavior scale, based on the number of behaviors a woman's partner exhibited. The controlling behavior scale was further subdivided into high versus low control, based on an examination of frequencies by site. Women whose partners used three or more controlling behaviors were deemed to exhibit "high control," constituting 32% of the combined sample of ever partnered women.

Type of violence. Finally, I created a variable called "type of violence" that identified women who had experienced physical partner violence only (no sexual or emotionally abusive acts); sexual partner violence only (no physical or emotionally abusive acts); emotional abuse only; physical and sexual but not emotional; physical and emotional but not sexual; and sexual and emotional but not physical; and all three types of partner violence.

5.2.2 Construction of indicator variables for latent class analysis

As summarized in Chapter 1 (see Table 1.1), authors have pursued distinct strategies for selecting indicator variables for use in latent class models. Most have used simple binary (yes/no) responses to a list of questions related to different violent acts.

I wanted to capture information on type and severity, but the absolute number of indicator variables that can be used for latent class analysis is limited by the need to avoid "sparse cells" in the multi-way contingency tables that LCA generates. If some cells of the contingency table are empty or have fewer than three to five observations, the standard goodness of fit statistics like the Pearson chi-square test of the likelihood ratio (L^2) chi- square test become invalid (Koehler 1986). The 14 acts of violence included in this study could theoretically generate 16,384 (2^{14}) different binary response patterns, even without considering frequency or severity. To avoid the problem of sparse cells, I created "intermediary" LCA variables, as described below.

The intermediary indicator variables combined information on the type of violence experienced (physical, sexual and emotional) with an indication of severity, either defined by type of act, a measure of frequency, or both. Research on the WHO data set reveals that frequency of different acts is highly correlated with severity of health consequence across most sites and most outcomes, suggesting that frequency of violence is a reasonable proxy for severity if no other measure is available (Ellsberg, Jansen et al. 2008). (Recall that for each act, women are asked whether they experienced it once, a few times or many times in the last year and before the last year).

LCA indicator variable for physical violence. For physical violence, if women had experienced any act of severe violence, they were coded as severe. Cases of moderate physical violence were further subdivided by frequency of occurrence giving equal weight to acts experienced within the last 12 months and those experienced before the last 12 months. The final indicator variable divided cases of physical violence into four categories:

- No physical violence
- Moderate only violence (one or two acts)
- Moderate only violence (a few times; many times)
- Severe violence (any frequency).

I was particularly interested in separating out isolated instances of moderate violence because preliminary analysis indicated that a substantial number of women across every site in the WHO database had experienced only one or two acts of moderate physical violence (analysis not shown).

LCA indicator variable for emotional abuse. For the items tapping emotional abuse, there is no clear way to rank acts by severity. No analysis has yet been published that demonstrates clearly which acts on the emotional abuse have more negative consequences or are perceived by women as more severe than others. It is especially difficult to predict given different cultural contexts, whether belittling and humiliating a woman in front of others, for example (question s704b), would have more negative consequences or be experienced as more severe than being scared on purpose or intimidated (question s704c). As a result, I created an indicator variable for emotional violence that broke cases down by frequency of each act (once, few, many) *and* by the number of different types of acts experienced (one or two types, versus three or more types). Acts experienced "many times" were deemed frequent. Acts experienced once or a few times only, were deemed "infrequent." Frequency and breadth of acts experienced are interpreted as the "intensity" of emotional abuse.

The **"intensity of emotional abuse"** is coded as follows:

- One to two types of emotional abuse—infrequently
- One to two types of emotional abuse—frequently
- Three or more types of emotional abuse—infrequently
- Three or more types of emotional abuse—frequently

LCA indicator variable for sexual violence. As with emotional abuse, it is difficult to make a priori judgments about the relative severity of the three different questions posed about sexual violence. There is less consensus in the field about how to measure sexual violence and less confidence among WHO investigators about how the specific WHO questions were understood in different settings. For example, qualitative investigation suggests that the question "did you ever have sexual intercourse

when you did not want to because you were afraid of what your partner might do" was interpreted differently in different sites and by different women (WHO study investigators' meeting, Bellagio, Italy, May 2004).

As a result, I relied exclusively on differences in frequency to create the LCA indicator for sexual violence. The frequency of sexual abuse was coded as follows:

- Sexual violence once or twice (any of the acts one time, but none a few or many times)
- Sexual violence a few times (any act a few times, but none many times)
- Sexual violence many times (any act many times)

5.2.3 Approach to LCA model fitting and evaluation

My analytic strategy for the latent class analysis proceeded as follows. First, I used the indicator variables described in section 5.2.2 to generate latent class models with from two to six classes of abuse for each site in Brazil and Peru. I compared models that allowed all types of violence to allocate freely to models that restricted to a single class of women who had never experienced any physical or sexual partner violence. I also explored using a partner's number of controlling behaviors in place of emotionally abusive acts as an alternative indicator variable. I assessed the relative goodness of fit of the various models using the Parametric Bootstap L^2 p-value, the Bayesian Information Criteria statistic, and the Bootstrap log-likelihood difference test. This final test evaluates whether adding a class within nested models improves model fit.

Second, I examined each of these classes in depth and explored whether and how they differed in terms of type and severity of violence, whether the distribution of response patterns to the indicator variables made sense from a theoretical and practice-based perspective. Third, I evaluated the robustness of the classification scheme by repeating the LCA analysis with comparable WHO data derived from rural Ethiopia and urban Namibia (Windhoek).

After identifying the "best model" using both statistical and theory-informed criteria, I conducted further analysis of the resulting LCA abuse types to explore four inter-related questions:

1. How do the LCA categories compare to the traditional WHO approach to defining and measuring partner violence?
2. Do the resulting LCA categories differ in terms of their relationship to known health outcomes of partner violence, including suicide ideation and attempts, overall health status, unwanted pregnancy, and problems performing one's usual activities in the last 4 weeks?
3. Do the different LCA categories differ in terms of their association with different risk and protective factors at the bi-variable level?
4. How do the LCA categories relate to controlling behavior, and what does this and the other findings imply about whether controlling behavior is a risk factor or a constituent part of abuse?

When exploring question 2, data limitations kept me from comparing the LCA categories against a broader array of outcome variables, such as how the woman responded to the violence, because early versions of the WHO questionnaire (including the version administered in Peru), only asked the questions on responses to violence of the women who had experienced *physical* partner violence.

Thus, regardless of subtypes of violence that LCA might identify, associations with the subtypes and outcome variables would be driven exclusively by the woman's experience of physical abuse. Since this would not capture the richness of the underlying latent construct, I limited the variables I explored to items asked of all women, not just those physically abused.

Finally, based on the above analysis and sample size considerations, I selected the "case" definition that I would use as my output measure in later chapters of the thesis.

5.3 Findings

5.3.1 Description of the populations sampled

Table 5.1 provides a demographic overview of the ever-partnered women interviewed in both Brazil and Peru. I have presented data on Cuzco city separately because women living there appear to differ significantly from those who live elsewhere in Cuzco. Given this fact, I present data on Cuzco city and Cuzco rural separately in many of the tables that follow.

In all sites, the majority of women were married or living with a male partner. Between 8% and 16% of women had a regular sexual partner but lived apart, except in rural Cuzco, where non-cohabitating partnerships were extremely rare (1%). With the exception of Pernambuco state, over half of women reported working for cash.

In many respects, women in Cuzco city more closely resembled women living in Lima or Sao Paulo than they did women in the rural parts of Cuzco province. For example, 50.9% of women in Cuzco city had completed secondary school, compared to 5.1% of women in rural Cuzco. This compares to 44.3% of women in Lima, 20.3% of women in Sao Paulo, and 4.6% of women in the state of Pernambuco. Likewise, only 9.3% of women living in Cuzco city had five or more children, compared to 42.4% of women elsewhere in the province.

Women in Cuzco city also demonstrated less traditional attitudes toward wife abuse and women's role in relationships. When queried about a range of factors that could justify a man beating a wife, 53% of ever-partnered women in Cuzco city accepted one or more of the reasons compared to fully 89.3% of women in other parts of Cuzco department. This compares to only 10.4% of women accepting one or more reasons for wife beating in Sao Paulo, Brazil. Similar distinctions emerge for rural Cuzco when probing women about their attitudes toward male dominance in the family. The survey included 4 questions that probed the degree to which women felt obliged to defer to men in terms of decisionmaking and with respect to sex. Fully 95% of ever partnered women in rural Cuzco agreed with one or more of the statements accepting male dominance.

Table 5.1 Description of population of ever-partnered women in Brazil and Peru, by site

Demographics	BRAZIL				PERU					
	Sao Paulo		Pernambuco		Lima		Cuzco city		Rural Cuzco	
Age range	n	%	n	%	n	%	n	%	n	%
Total ever-partnered women	940	100	1188	100	1090	100	344	100	1192	100
15-19	58	6.2	89	7.5	57	5.2	15	4.4	53	4.4
20-24	130	13.8	178	15.0	152	13.9	44	12.8	170	14.3
25-29	173	18.4	256	21.6	187	17.2	85	24.7	228	19.1
30-34	142	15.1	203	17.1	231	21.2	71	20.6	225	18.9
35-39	178	18.9	199	16.8	177	16.2	73	21.2	210	17.6
40-44	148	15.7	154	13.0	144	13.2	27	7.8	156	13.1
45-49	111	11.8	108	9.1	142	13	29	8.4	150	12.6
Education										
0 to 8 years	465	49.5	892	75.0	2331	21.2	68	19.8	984	82.6
9 to 11 years	284	30.2	242	20.4	376	34.5	101	29.4	147	12.3
12 plus years	191	20.3	54	4.6	482	44.3	175	50.9	61	5.1
Current partnership status										
Currently married	490	52.1	494	41.6	481	44.1	118	34.3	654	54.6
Living with man, not married	191	20.3	479	40.3	305	28	137	39.8	410	34.4
Regular partner; living apart	154	16.4	93	7.8	130	11.9	30	8.7	12	1.0
Divorced/separated	92	9.8	94	7.9	93	8.5	34	9.9	64	5.4
Widowed	13	1.4	28	2.4	13	1.2	2	0.6	38	3.2
No current partner; former sexual liaison[17]	--	--	--	--	68	6.2	23	6.7	14	1.2
Number of children										
None	203	21.6	132	11.1	194	17.8	58	16.9	48	4.0
1 or 2	512	54.5	543	45.7	509	46.7	181	52.6	345	28.9
3 or 4	198	21.1	331	27.9	292	26.8	73	21.2	293	24.6
5 or more	27	2.9	182	15.3	95	8.7	32	9.3	506	42.4
Household asset wealth										
Low	336	35.9	320	27.0	141	13.0	1	0.3	679	57.2
Medium	367	39.3	748	63.1	262	24.2	83	24.3	474	39.9
High	232	24.8	117	9.9	680	62.8	257	75.4	34	2.9
Earning cash										
Yes	607	64.6	476	40.1	762	71	274	79.7	657	57.4
No	333	35.4	711	59.9	311	29	70	20.3	488	42.6

[17] Peru's definition of ever- partnered included women who had a non-regular, sexual partner in that past that resulted in a child. Brazil did not collect information on women without a current partner

Attitudes	n	%	n	%	n	%	n	%	n	%
Accepts 1 or more justifications for wife beating	95	10.2	370	31.6	352	34.5	169	53.0	915	89.3
Accepts 1 or more of 4 norms related to male dominance	496	54.9	1040	90.0	535	50.8	201	62.6	1049	95.1

5.3.2 Factor analysis of emotional abuse and controlling behavior

I employed factor analysis to evaluate whether the seven questions on controlling behaviors and the four emotional abuse questions should be conceptualized as one construct or as separate constructs (as originally intended). Factor analysis of all eleven questions on the combined Brazil and Peru data set, yielded a two-factor solution. All but one of the controlling behavior questions (s703a to s703g) loaded on factor 1 and the emotional abuse questions loaded on factor 2 (see Table 5.2 and Figure 5.1). Question s703d of the controlling behavior scale (ignores you and treats you indifferently), loaded with the emotional abuse items, not with the controlling behaviors. This suggests that this item is tapping a construct closer to emotional abuse than to control—an observation that has face validity given the emotional impact of being treated indifferently by a spouse. Separate factor analysis of these questions for each individual site in Brazil and Peru, produced similar results.

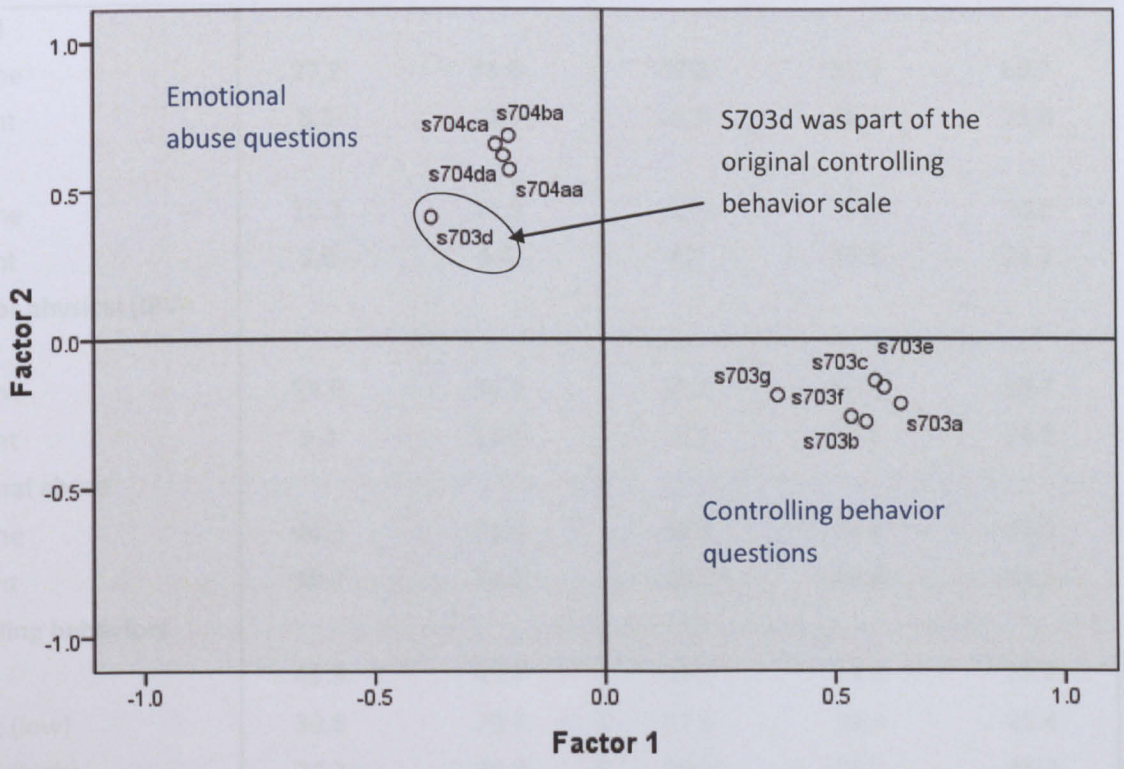
Thus for the purposes of the descriptive analysis using the WHO definitions and for the latent class analysis, I added question s703d (ignores you or treats you indifferently) to the existing questions designed to tap emotional abuse. Adding the fifth emotional abuse question increased the total number of women experiencing any act of emotional abuse in the full sample by 131 women (or 2.8%) (not shown).

The remaining controlling behavior scale had six items and a Cronbach's α of 0.78. Item test-rest correlation analysis (comparing scale properties with and without each individual item in the scale, demonstrated that no further improvement would be achieved by removing additional items (Nunnally and Bernstein 1994).

Table 5.2 Factor analysis loadings for emotional abuse and controlling behaviors, combined Brazil and Peru samples

		Factor analysis (principal axis) with varimax rotation		
		Rotated Factor Matrix	Factor	
			1	2
Controlling behavior Q's	s703a	Tried to keep you from seeing friends	.645	-.219
	s703b	Restricts contact with your family	.571	-.279
	s703c	Insights on knowing where you are at all times	.591	-.141
	s703d	Ignores you, treats you indifferently	-.373	.409
	s703e	Gets angry if you speak with another man	.610	-.163
	s703f	Is often suspicious that you are unfaithful	.538	-.262
	s703g	Expects you to seek permission for health care	.378	-.190
Emotional abuse Q's	s704a	Insulted or made you feel bad about yourself	-.203	.570
	s704b	Belittled or humiliated you in front of others	-.205	.685
	s704c	Did things to scare or intimidate you on purpose	-.233	.656
	s704d	Threatened to hurt you or someone you care about	-.216	.617

Figure 5.1 Factor plot in rotated factor space for emotional abuse and controlling behavior items, combined Brazil and Peru sample



5.3.3 Patterning of partner violence using WHO case definitions

This section explores how different types of violence intersect, using the case definitions employed in the WHO study.

Prevalence by type. Both lifetime and 12-month prevalence of physical or sexual abuse by an intimate partner is considerably lower in Brazil than in Peru. Lifetime IPV-WHO varies from 28.9% in Sao Paulo to 69.7% in rural Cuzco. Roughly one third to half of all women who have ever experienced physical or sexual partner violence have experienced acts of abuse within the last 12 months (see Table 5.3).

Levels of controlling behavior are also lower in Brazil than in Peru, with levels of high control especially prevalence in Cuzco province. The prevalence of high control increases in stepwise fashion from 24.2% and 26.7% in Sao Paulo and Pernambuco to 29.0% in Lima, 39.2% in Cuzco city and 45.2% in rural Cuzco. Almost half of the women in Brazil experienced none of the controlling behaviors listed, whereas only one quarter of those in Cuzco province led lives free of such controls.

Table 5.3 Percent of ever-partnered women in Brazil and Peru who have experienced different types of partner violence and controlling behaviors

	Brazil		Peru		
Type of violence	**Sao Paulo** n=940	**Pernambuco** n=1188	**Lima** n=1087	**Cuzco city** n=344	**Rural Cuzco** n=1191
Physical					
Lifetime	27.2	33.8	48.6	61.9	60.7
Current	8.3	12.9	16.9	28.2	23.8
Sexual					
Lifetime	10.1	14.3	22.5	35.5	50.0
Current	2.8	5.6	7.1	17.2	24.7
Sexual or physical (IPV-WHO)					
Lifetime	28.9	36.9	51.2	66.9	69.7
Current	9.3	14.8	19.1	33.1	34.5
Emotional abuse*					
Lifetime	44.3	51.3	59.8	73.0	72.0
Current	18.7	24.2	30.7	44.8	42.5
Controlling behaviors					
None	45.3	43.7	33.2	24.4	25.4
1 or 2 (low)	30.6	29.7	37.9	36.3	29.4
3 to 6 (high)	24.2	26.7	29.0	39.2	45.2

*Emotional abuse here includes the four original WHO questions and s703d

Sexual violence. In all settings far fewer women report sexual abuse by a partner, than report physical abuse. The majority of women who do report sexual coercion by a partner, report forced sexual intercourse rather than some other sexual act or type of coercion (see Table 5.4). Note especially the extraordinarily high rate of sexual violence by partners in rural Cuzco: Fully half of all ever-partnered women report being forced into sex by an intimate partner. Elsewhere the lifetime prevalence of coerced sex within relationships varies from 10.1% in Sao Paulo to 35.5% of ever-partnered women in Cuzco city. Only a relatively small proportion of women (1.9% in Sao Paulo to 9.1% in rural Cuzco) report all three types of sexual partner violence in their lifetimes.

Table 5.4 Percent of ever-partnered women who have experienced different types of sexual violence by an intimate partner since the age of 15, Brazil and Peru

	Brazil		Peru		
Type of sexual violence	**Sao Paulo** n=940	**Pernam-buco** n=1188	**Lima** n=1087	**Cuzco city** n=344	**Cuzco rural** n=1191
Physically forced to have intercourse	8.3	10.3	16.4	25.3	41.1
Forced because you were afraid of what he might do	7.0	9.7	15.8	26.7	40.5
Forced to do something degrading or humiliating	3.3	5.3	8.1	11.1	11.3
Any one of the above experiences	10.1	14.3	22.5	35.5	50.0
Any two experiences	6.1	6.9	12.1	19.5	33.5
Experienced all three acts	1.9	3.3	4.8	7.6	9.1

Emotional abuse. Emotionally abusive acts and threats of harm were also exceedingly common. Using the expanded five-item definition of emotional abuse, between 44% and 73% of women reported one or more of the abusive acts listed (including verbal abuse, attempts to beliitle or humiliate her in public, ignoring her or treating her indifferently, intimidating or scaring her on purpose, or threatening to harm her or somone she cares about). The 12-month prevalence rate was somewhat lower, with between 18.7% and 44.8% of women reporting having experienced one or more of the behaviors (see Table 5.3). Again, the highest prevalence was seen in Cuzco province.

Roughly one fifth to one-third of women reported three or more of the different emotionally abusive behaviors (see Table 5.5). Women who reported having received a behavior "many times" in the past 12 months, (or earlier if she did not report current emotional abuse) are categorized in this table as having received "frequent abuse." Women who reported acts "once" or "a few times" are categorized as receiving 'infrequent" emotional abuse.

Table 5.5 Percent of ever-partnered women who have experienced different types and frequencies of emotional abuse by an intimate partner since the age of 15, by site

	No acts listed	1 to 2 types	3 or more types	Ever-partnered women	No acts listed	Infrequent a	Frequent (many)	Ever-partnered women
Site	%	%	%	Total	%	%	%	Total
Sao Paulo	55.7	26.3	18.0	940	55.7	27.6	16.7	940
Pernambuco	48.8	26.3	24.9	1188	44.8	29.8	21.5	1188
Lima	40.5	39.1	20.6	1086	40.5	40.6	19.0	1086
Cuzco city	27.0	38.4	34.6	344	27.0	42.7	30.2	344
Cuzco rural	28.1	39.7	32.3	1190	28.1	49.0	22.9	1190

[a] Infrequently includes: once or twice, and a few times

Severity of physical partner violence. Tables 5.6 through 5.8 summarize the nature and severity of the physical partner violence that abused women report in the WHO study. As column 1 of Table 5.7 highlights, a large proportion of all physical partner violence qualifies as severe—ranging from 52.5% or reported physical violence in Lima Peru to 83.8% of physical violence in rural Cuzco province. The actual percentage of women reporting at least one act of severe physical violence by a partner in their lifetime varies dramatically by setting, with 15.5% of women having experienced severe violence in Sao Paulo Brazil to 50.8% of women in Cuzco province. Cuzco city is not far behind, with 42.2% of women reporting severe physical violence by a partner.

Table 5.6 Percent of ever-partnered women who have experienced different severities of physical violence by an intimate partner since the age of 15, by site.

	Any physical IPV		Physical IPV Any moderate act		Physical IPV Moderate only acts		Physical IPV Any severe act	
Site	Count	%	Count	%	Count	%	Count	%
Sao Paulo	256	27.2	248	26.4	110	11.7	146	15.5
Pernambuco	401	33.8	377	31.7	164	13.8	237	20.0
Lima	528	48.6	513	47.2	251	23.0	277	25.5
Cuzco city	213	61.9	207	60.2	68	19.8	145	42.2
Cuzco rural	723	60.7	685	57.5	117	9.8	606	50.8

Table 5.7 Nature of physical partner violence, percent severe and percent infrequent, by site

	Percent of physical IPV that is severe	Percent of all physical IPV that is once or twice	Percent of physical IPV (moderate only) that is once or twice	Percent of physical IPV (severe) that is once or twice
Site	Column1	Column 2	Column 3	Column 4
Sao Paulo	57.0	30.1	66.4	4.0
Pernambuco	59.1	31.2	66.7	14.0
Lima	52.5	29.2	59.4	5.0
Cuzco city	68.1	32.9	61.8	2.0
Cuzco rural	83.8	10.0	51.3	12.0

As noted in Table 5.8, a far greater percentage of women who experienced acts labeled as severe, report being injured, seeking health care, and leaving the relationship due to the violence for at least one night. For example, between 80.6% and 96.7% of all injuries are sustained by women reporting acts categorized as severe. The distinction is even starker when considering health care: more than 90% of women who reported needing health care due to an abuse-related incident, experienced severe physical violence.

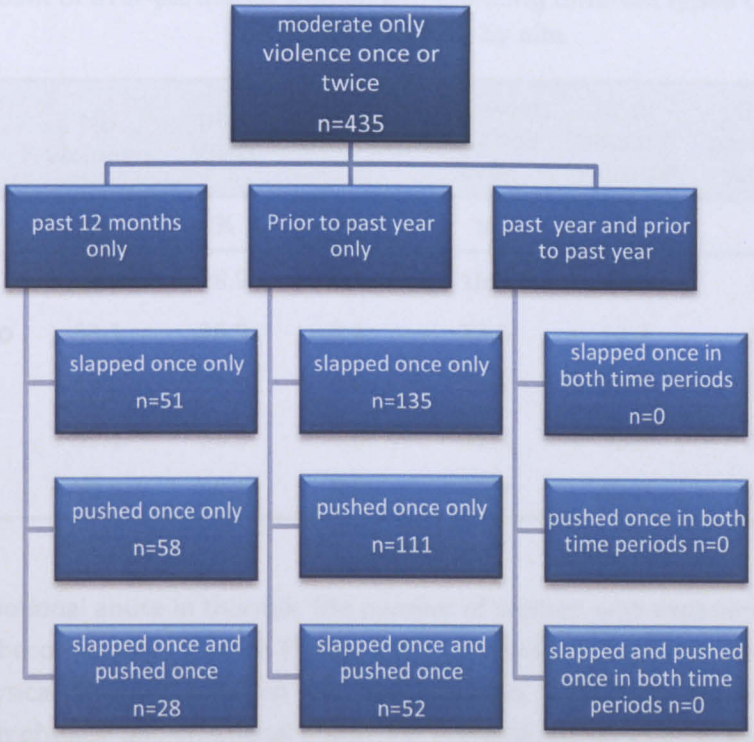
Table 5.8 Percent of women who have suffered severe partner violence, among those reporting injury, needing health care, or leaving for at least one night, by site

Site	Of those reporting injury, percent who have experienced:			Of those needing health care, percent who have experienced:			Of those who have left home, percent who have experienced:		
	Moderate only	Severe	Injured	Moderate only	Severe	Needs HC	Moderate only	Severe	Left home
	%	%	Count	%	%	Count	%	%	Count
Sao Paulo	10.8	89.2	102	8.3	91.7	36	22.6	77.4	106
Pernambuco	12.0	88.0	150	9.3	90.7	54	23.4	76.6	205
Lima	19.4	80.6	242	3.4	96.6	59	24.5	75.5	143
Cuzco city	11.0	89.0	127	5.2	94.8	58	15.7	84.3	70
Rural Cuzco	3.3	96.7	392	1.2	98.8	172	7.7	92.3	235

Further investigation of the category of violence labeled moderate reveals that between half to two thirds of women who experience only moderate violence, reported being pushed, shoved, slapped or having something thrown at them (see column 3, Table 5.7) only once or twice. Of these, the

majority appears to be a single incident that took place in the past (See Figure 5.2). Of the 435 women who fall into this category, up to 80 of them could have experienced a slap or shove on two separate occasions, although they may have experienced both acts in a single incident. Because of the way the violence questions are structured, it not possible to determine explicitly whether acts of slapping and pushing reported in the same time frame are referring to a single incident or two separate events.

Figure 5.2 Breakdown of cases of moderate only violence once or twice



By contrast, single acts of severe physical violence were exceedingly rare, constituting 2% to 5% of cases in urban areas and only 12% to 14% of cases in rural areas. One-time experiences of physical violence constitute roughly 30% of *all* physical violence in Sao Paulo, Pernambuco, Lima, and Cuzco city, and 10% of physical violence elsewhere in Cuzco province (see Table 5.7).

In Brazil, if one excludes cases of one or two acts of moderate violence only, the lifetime prevalence of IPV-WHO goes from 28.9% to 23% in Sao Paulo and from 36.9% to 30.4% in Pernambuco. If one excludes one or two acts of slapping pushing or shoving if the woman has also never experienced sexual violence or high intensity emotional abuse, the effect on prevalence is slightly less, equaling 24.7% in Sao Paulo, and 32.5% in Pernambuco. This definitional change reduces overall lifetime prevalence by roughly 4% in both Brazilian sites. In Peru, the same adjustment reduces lifetime prevalence of IPV-WHO by 9% in Lima and 2.9% in Cuzco province.

Overlap of lifetime violence by type. In most instances, sexual partner violence occurs together with physical violence. In all sites combined, 83.3% of women who experienced sexual violence also experienced physical violence (not shown). Indeed, between 60% and 70% of women experiencing any sexual violence also experienced at least one act of severe physical abuse, suggesting that these two types of abuse tend to co-vary.

As a result, sexual abuse in isolation is generally rare. Only 1.7% of women in Sao Paulo and 3.1% of women in Pernambuco state report only sexual abuse by their partner, with moderately higher rates among ever-partnered women in Lima (2.6%) and in rural Cuzco (8.9%). See Table 5.9.

Table 5.9 Percent of ever-partnered women experiencing different types of partner violence (WHO definitions), by site

	No violence	IPV-WHO	Sexual violence only	Physical violence only	Both sexual & physical	Ever-partnered women	
	%	%	%	%	%	%	N
Sao Paulo	71.1	28.9	1.7	18.8	8.4	100	940
Pernambuco	63.1	36.9	3.1	22.6	11.2	100	1188
Lima	49.0	51.0	2.6	28.5	20.0	100	1086
Cuzco city	33.1	66.9	4.9	31.4	30.5	100	344
Cuzco rural	30.5	69.5	8.9	19.7	41.0	100	1190

If we include emotional abuse in this mix, the number of women who experience sexual or physical violence alone, becomes even smaller (Table 5.10). Likewise, it becomes clear that the category designated "physical violence only" in the WHO lexicon, is in fact largely women who have experienced both physical *and* emotional abuse. For example, rather than 31.4% of women suffering only physical violence in Cuzco city (see Table 5-9), all but 6.0% of these women actually experienced physical and emotional violence (Table 5-10).

Table 5.10 also highlights that if emotional abuse were included in the WHO definition of partner violence, prevalence estimates would increase by 10.6% to 17.9% depending on the site—representing those women who report experiencing *only* emotional abuse by a partner in their lifetime.

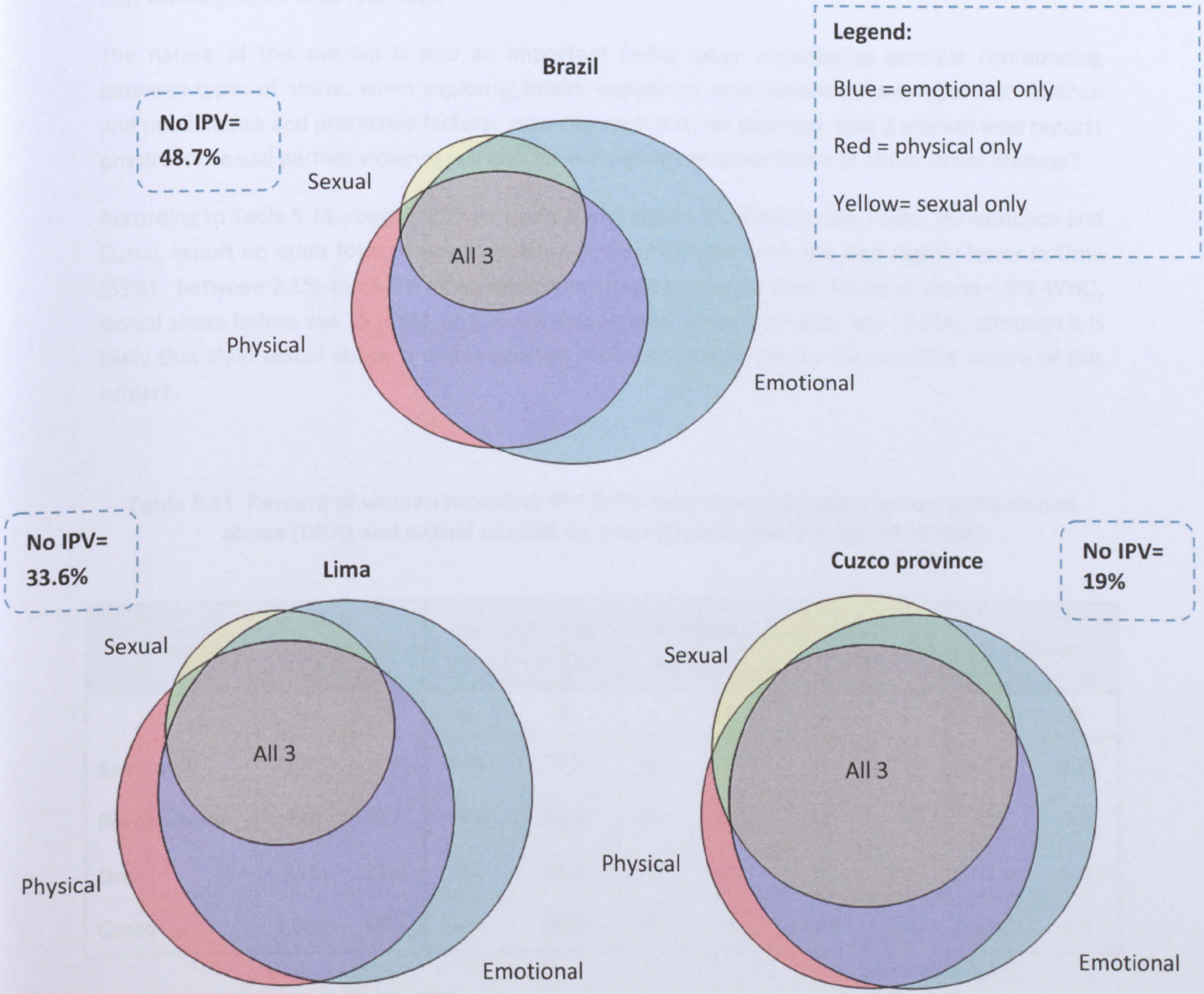
Table 5.10 Percent of ever-partnered women experiencing different types of partner violence including emotional abuse, by site

Types of IPV experienced	Brazil		Peru		
	Sao Paulo n=940	Pernam Buco n=1188	Lima n=1087	Cuzco city n=344	Cuzco rural n=1191
No IPV	52.8	45.4	33.6	19.1	19.0
IPV-WHO	28.9	36.9	51.0	66.9	69.5
Physical IPV only	3.7	3.4	6.1	6.0	3.6
Sexual IPV only	0.1	1.0	0.3	0.9	4.0
Emotional abuse only	17.9	17.8	14.5	13.1	10.6
Physical, sexual, no emotional	0.4	0.3	1.0	1.8	2.4
Sexual, emotional, no physical	1.5	2.2	2.3	4.2	4.3
Physical, emotional, no sexual	15.3	18.9	22.9	25.6	16.4
All three types together	8.2	11.2	19.3	29.5	39.9

The distribution of overlap between types of violence is easiest to visualize using proportional venn diagrams. Figure 5.3 illustrates the high degree of overlap between physical, sexual and emotional abuse apparent in both Brazil and Peru. Since the pattern is almost identical in Sao Paulo and Pernambuco, these sites are presented together.

The area colored grey represents the subset of partner violence cases that experience all three forms of abuse—physical, sexual and emotional violence. (Note: in these figures, the blue emotional abuse circle includes question s703d (treats you indifferently). What is immediately apparent is that a greater proportion of ever-abused women in Peru have experienced all three forms of abuse, compared to women in Brazil. Women in Cuzco province are especially prone to multiple overlapping forms of abuse. Indeed, the vast majority of women from Cuzco who have experienced any form of partner violence, have experienced all three forms of abuse.

Figure 5.3 Overlap of types of lifetime partner violence among ever-partnered women by site



Lifetime experiences of violence and overlap by type (WHO definitions). Another key aspect of violence is the degree to which women experiences different types of violence during their life course. What proportion of women abused by an intimate partner also have child sexual abuse in their background? How common is it for women who were sexually abused as children to also experience sexual assault or partner violence later in life? The degree of overlap here may prove relevant when evaluating the potential cumulative impacts of multiple traumatic events in one woman's lifetime.

Once again, proportional Venn diagrams provide a useful way to visualize the degree of overlap among multiple forms of physical and sexual abuse (see Figures 5.4). These diagrams immediately

highlight the degree to which partner violence visually dominates the profile of abuse in women's lives. Partner violence, here depicted by a blue circle, far outstrips child sexual abuse (sexual contact before age 15) or sexual assault by nonpartners after age 15 as a component of the abuse histories that women report in all four sites.

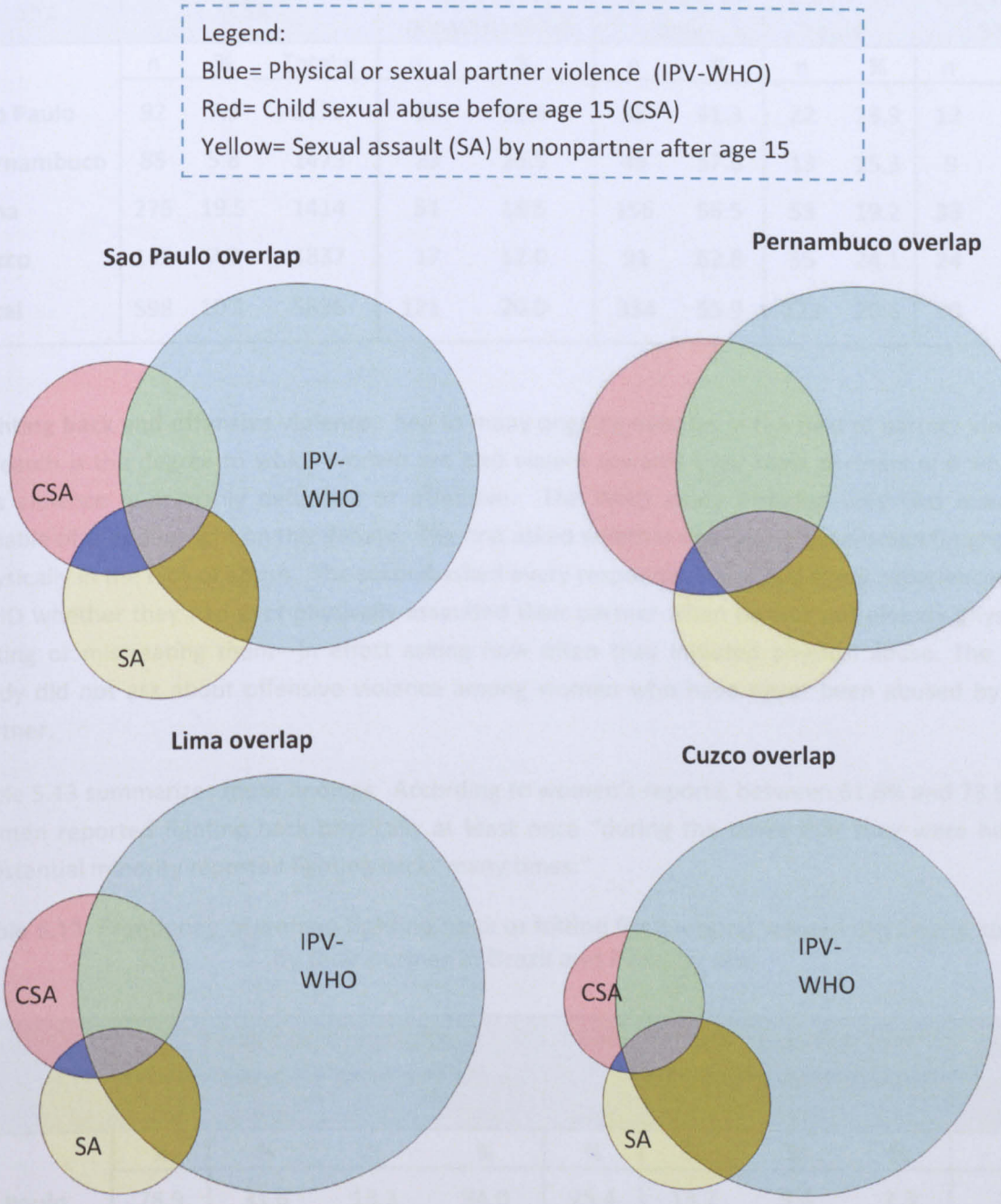
The nature of this overlap is also an important factor when considering possible confounding between types of abuse, when exploring health impacts or associations between partner violence and possible risk and protective factors. How common is it, for example, that a woman who reports physical or sexual partner violence will also have experienced other forms of abuse in her lifetime?

According to Table 5.11, roughly 80% of women who report IPV-WHO in Sao Paulo, Pernambuco and Cuzco, report no other form of sexual violence in their lifetime, with the rate slightly lower in Lima (63%). Between 2.1% and 5.9% of women report experiencing all three forms of abuse—IPV-WHO, sexual abuse before age 15 (CSA), and sexual assault by a nonpartner after age 15 (SA), although it is likely that child sexual abuse is underreported in these samples due to the sensitive nature of this subject.

Table 5.11 Percent of women reporting IPV-WHO who have also experienced child sexual abuse (CSA) and sexual assault by a nonpartner after the age of 15 (SA)

Site	IPV-WHO n=2325		IPV-WHO, but no CSA or SA		IPV-WHO + CSA only		IPV-WHO + SA only		All three	
	N	%	n	%	n	%	n	%	n	%
Sao Paulo	272	29.0	215	79.0	38	14.0	31	11.4	12.0	4.4
Pernambuco	438	36.9	366	83.6	49	11.2	32	7.3	9.0	2.1
Lima	556	51.0	352	63.3	156	28.1	81	14.6	33.0	5.9
Cuzco	1,059	69.0	844	80.0	91	8.6	148	14.0	24.0	2.3

Figure 5.4 Patterning of different types of violence across the life course among women in Brazil and Peru, by site



If considered from the perspective of women reporting child sexual abuse, a far larger proportion of women report other forms of abuse. Only 12% to 32.6% of child sexual abuse victims (compared to 80% of IPV victims) report no other form of abuse in later life—meaning that over two thirds of all child sexual abuse survivors suffer multiple forms of violence. The proportion of victims who experience all three types is also higher than with partner violence, varying between 10.6% of child sexual abuse survivors is Pernambuco state to 16.6% of survivors in Cuzco province (see Table 5-12).

Table 5.12 Percent of women who experienced sexual abuse younger than 15 (CSA), who have experienced IPV-WHO and/or sexual assault by a non-intimate since the age of 15, by site

Site	CSA			CSA but no IPV-WHO or SA		CSA & IPV only		CSA & SA only		CSA, IPV & SA	
	n	%	Total n	n	%	n	%	n	%	n	%
Sao Paulo	92	7.9	1172	30	32.6	38	41.3	22	23.9	12	13.0
Pernambuco	85	5.8	1473	23	16.5	49	57.6	13	15.3	9	10.6
Lima	276	19.5	1414	51	18.5	156	56.5	53	19.2	33	11.9
Cuzco	145	7.9	1837	17	12.0	91	62.8	35	24.1	24	16.6
Total	598	10.1	5896	121	20.0	334	55.9	123	20.6	78	13.0

Fighting back and offensive violence. Key to many ongoing debates in the field of partner violence research is the degree to which women are also violent towards their male partners and whether this violence is primarily defensive or offensive. The WHO study included only two questions capable of shedding light on this debate. The first asked whether and how often women fought back physically in the face of abuse. The second asked every respondent who had every experienced IPV-WHO whether they had ever physically assaulted their partner when he was not already physically hitting or mistreating them—in effect asking how often they initiated physical abuse. The WHO study did not ask about offensive violence among women who have never been abused by their partner.

Table 5.13 summarizes these findings. According to women's reports, between 61.6% and 78.9% of women reported fighting back physically at least once "during the times that they were hit." A substantial minority reported fighting back "many times."

Table 5.13 Frequency of women fighting back or hitting first, among women physically abused by their partner in Brazil and Peru, by site

	Fought back physically				Hit or mistreated partner first				Women physically abused
	Ever	Once or twice	Several times	Many times	Ever	Once or twice	Several times	Many times	
	%	%	%	%	%	%	%	%	n
Sao Paulo	78.9	31.6	13.3	34.0	25.4	13.7	9.4	2.3	256
Pernambuco	63.0	24.8	13.5	24.8	16.0	9.7	3	3.2	401
Lima	74.2	44.2	19.5	10.4	24.7	15.9	8	0.7	527
Cuzco city	70.0	40.4	20.7	8.9	25.3	17.8	6.6	0.9	213
Cuzco rural	61.6	35.3	21.5	4.9	9.3	7.6	1	0.7	722

In addition to self defense, between 9.3% and 25.4% of physically abused women in Brazil and Peru report being the first to physically aggress against their partner, although the majority report doing so on only one or two occasions. Women in urban areas appear substantially more likely to be physically aggressive than women in rural areas of either Brazil or Peru.

Across the combined Brazil and Peru sample, women who experienced severe physical violence by a partner were less likely ever to have fought back ($x^2 = 72.2; p < .0001$)—a pattern that was maintained in Cuzco city and department and Pernambuco state, but not in Sao Paulo and Lima. Those women who fought back, however, were significantly more likely to have experienced severe rather than only moderate physical abuse—a pattern maintained across all sites. Among all physically abused women in Brazil and Peru who fought back, 69% experienced severe physical violence (not shown).

5.3.4 Defining cases based on latent class analysis

The following section describes the outcome of the latent class analysis and the process of selecting the best model to represent categories of partner violence in this data set.

Unrestricted latent class solution. Initial results of the latent class analysis suggested a three cluster solution as appropriate for all four sites, including Sao Paulo, Pernambuco, Lima and Cuzco (see Table 5.13). In Lima, both a three cluster and a four-cluster solution were statistically viable and the p value for improvement in fit of the four cluster over the three cluster solution was borderline (p=0.05). In depth assessment of both options, however, demonstrated that the four cluster solution added little conceptual clarity—it merely split cluster 3, making relatively minor distinctions between various moderate types of emotional abuse. Given that all of the other sites worked well with a three cluster solution, I provisionally selected the threee cluster model as the best solution for Lima as well.

Table 5.14 Provisional three cluster latent class solution

	Model Solutions							
	Best solution	No paramters	DFs	P value	Bootstap P	Comparison of 3 to 4 cluster model	Entropy R^2	Classifi-cation error
Sao Paulo	3 cluster	26	13	0.48	p=.77	p=.68	68%	11%
Pernambuco	3 cluster	26	13	0.84	p=.98	p=.80	71%	11%
Lima	3 cluster	26	13	0.03	p=.09	**	67%	16%
	4 cluster	35	4	0.05	p=.44	p=.05	63%	21%
Urban Cuzco	3 cluster	26	13	0.21	p=.57	p=.77	72%	12%
Rural Cuzco	3 cluster	23	16	0.14	p=.29	p=.23	63%	17%
Cuzco province	3 cluster	26	13	0.51	p=.66	p=.49	61%	19%
All together	3 cluster	26	13	0.09	p=.16	p=.23	65%	15%

The three-cluster solution yielded a breakdown of cases that roughly corresponded to no violence, moderate violence, and severe violence (see Table 5.14). However, cluster 1 included all of the non-abused women as well as a significant number of women who had experienced some violent acts.

Roughly a quarter of women in cluster 1 in Cuzco city and rural Cuzco had experienced physical and/or sexual violence as well as a range of emotionally abusive acts.

Table 5.15 Percent of women in unrestricted model solution who have experienced sexual or physical assault by a partner (IPV-WHO)

	Cluster 1	Cluster 2	Cluster 3
Sao Paulo	4	82	100
Pernambuco	6	79	100
Lima	9	58	99
Cuzco city	23	90	100
Cuzco rural	26	100	100

Women in cluster 1 who had experienced acts of physical or sexual partner violence reported significantly higher rates of poor or very poor health ($\chi^2 = 2.4$, $p \leq 0.05$), lifetime measures of suicide ideation ($\chi^2 = 9.8$, p=002), and higher mental distress ($\chi^2 = 45.6$, $p \leq 0.001$), compared to women who had not experienced such acts. Given the measureable health and well being impacts of the acts allocated to cluster 1, it seemed appropriate to exclude them from the no-violence reference class.

Restricted latent class solution. Latent Gold allows the user to restrict the posterior membership of certain subsets of cases. I used this technique to restrict anyone who had experienced acts of physical or sexual partner violence from cluster 1. I allowed emotionally abusive acts to distribute freely. It seemed potentially overly restrictive to define a priori as a "case of violence" any woman who had experienced any emotionally abusive act in her lifetime, especially given the field's lack of experience measuring and defining emotional abuse across cultures.

With restrictions imposed, the range of model solutions that met statistical goodness of fit criteria had a higher number of classes (four to five) compared to the unrestricted model (three classes). From a purely statistical standpoint, the best model fit was a five cluster solution for Cuzco province (combined city and rural) and a four cluster solution for the other three sites (see Table 5.15).

Table 5.16 Log likelihood, chi-square and classification statistics for lifetime partner violence in Brazil and Peru, by site

Site	Model description	LL	BIC(LL)	Npar	L^2	BIC(L^2)	Df	Bootstrap p	Class. err.	Entropy R^2
Lima	4 cluster, restricted	-3112.9	6526.36	43	62.50	-741.28	115	0.12	0.05	0.89
Cuzco	5 cluster, restricted	-5036.6	10469.17	54	49.82	-712.954	104	0.14	0.09	0.85
Sao Paulo	4 cluster, restricted	-2008.62	4311.57	43	43.43	-743.73	115	0.55	0.03	0.93
Pernambuco	4 cluster, restricted	-2904.51	6113.42	43	56.08	-758.03	115	0.18	0.04	0.91

Selecting the final model solution. Detailed assessment of the model solutions confirmed that the solution that was preferable statistically, was also the option that made the most conceptual and theoretical sense, namely a five-cluster solution for Cuzco province (combining the city and rural areas), and a four-cluster solution for the other three sites.

Latent Gold generates three outputs that can be used to conceptually evaluate models: the profile matrix, the probability matrix, and the item response matrix. By way of example, I present below, the outputs for the province of Cuzco (combining the city and rural areas).[18]

Table 5.16 (next page) is the profile matrix. The second shaded row of the table lists what proportion of women in the study fall into each of the different latent "clusters" (31%, 25%, 19%, 17%, 8%). The column percentages for each type of violence add to 100% and communicate the conditional probabilities that a woman in that cluster will have experienced that particular type of abuse. For example, 31% of respondents from Cuzco appear in cluster 1. Women in cluster 1 have a 59% probability of having experienced no emotionally abusive acts and a 34% chance of having experienced relative minor emotional abuse (two or less forms, infrequently). None of the women in this cluster have experienced any physical or sexual violence—as would be expected given the restriction imposed on the latent class analysis. By contrast, women in cluster 2 have 75% chance of having experienced three or more types of emotional abuse frequently (many times) and only a 2% probability of having experienced no emotional abuse. Likewise they have a 98% probability of having experienced severe physical abuse and a 42% probability of experiencing sexual partner violence "many times."

[18] While presenting only the example of Cuzco province here, I examined in detail, the answer classes and probability, profile matrices of dozens of model options before deciding upon the final best model solution.

Table 5.17 Profile matrix of latent class models for Cuzco province, 5-cluster restricted solution

Profile matrix	No violence	Systematic	Mixed Less severe	Physical	Sexual dominant
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Percent of cases in cluster	0.31	0.25	0.19	0.17	0.08
Emotional abuse					
No emotional violence	0.59	0.02	0.06	0.24	0.40
1 to 2 forms, infrequently	0.34	0.02	0.53	0.48	0.46
3+ forms, infrequently	0.03	0.06	0.40	0.15	0.11
1 to 2 forms, frequently	0.02	0.15	0.00	0.08	0.01
3+ forms, frequently	0.01	0.75	0.01	0.05	0.02
	100%	100%	100%	100%	100%
Physical violence					
No physical violence	1.00	0.02	0.00	0.00	0.79
Moderate only (one act)	0.00	0.00	0.03	0.25	0.19
Moderate only (few, many)	0.00	0.02	0.13	0.15	0.00
Severe violence	0.00	0.96	0.85	0.60	0.02
	100%	100%	100%	100%	100%
Sexual violence					
No sexual violence	1.00	0.20	0.14	0.87	0.00
Once	0.00	0.05	0.09	0.11	0.33
A few times	0.00	0.33	0.67	0.01	0.56
Many times	0.00	0.42	0.10	0.00	0.12

Note: *In the probability matrix, the numbers represent the proportion of that type of act that falls within each cluster. The numbers highlighted in blue illustrates where each act is concentrated by cluster.*

Table 5.18 is the probability matrix, which describes how each type of violence breaks out by cluster. Rows add to 100%. For example, 91% of all cases of "intensive" emotional abuse (three or more different forms of emotional abuse, experienced frequently fall into cluster 2 as do 76% of cases of sexual violence experienced many times. By contrast, 66% of cases of single acts of moderate violence fall into cluster 4.

Table 5.18 Probability matrix of latent class models for Cuzco province, 5-cluster restricted solution

Probability matrix	No violence	Systematic	Mixed less severe	Physical	Sexual Dominant
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Percent of cases in cluster	31	25	19	17	8
Emotional abuse					
No emotional violence	0.66	0.01	0.04	0.15	0.14
1 to 2 forms, infrequently	0.31	0.01	0.30	0.25	0.13
3+ forms, infrequently	0.07	0.11	0.56	0.19	0.08
1 to 2 forms, frequently	0.11	0.62	0.01	0.25	0.01
3+ forms, frequently	0.02	0.91	0.01	0.05	0.01
Physical violence					
No physical violence	0.79	0.01	0.00	0.00	0.20
Moderate only (one act)	0.00	0.00	0.07	0.66	0.27
Moderate only (few, many)	0.00	0.08	0.45	0.47	0.01
Severe violence	0.00	0.46	0.33	0.21	0.00
Sexual violence					
No sexual violence	0.58	0.09	0.05	0.28	0.00
Once	0.00	0.14	0.22	0.24	0.40
A few times	0.00	0.30	0.49	0.01	0.21
Many times	0.00	0.76	0.14	0.00	0.09

Note: *In the probability matrix, the numbers represent the proportion of that type of act that falls within each cluster. The numbers highlighted in blue illustrates where each act is concentrated by cluster.*

A final output of interest is the combination of answers that characterize the responses in each latent class. Table 5.19 lists the most frequent answer combinations and the number of women giving that combination for each cluster in the five-cluster solution in Cuzco province. From this chart, I derived descriptive labels for each category of violence, namely no violence (no sexual or physical violence; infrequent, mild emotionally abusive acts only), systematic violence, mixed violence (less severe), physical violence, and sexual dominant violence.

Table 5.19 Most common response patterns by type of violence in Cuzco province

Category of violence	Description of modal cases		
	Emotional abuse	Physical violence	Sexual violence
No violence[a]			
n=282	None	None	None
n=162	2 or less forms, infrequently	None	None
Systematic			
n= 110	3 or more forms, frequently	Severe physical violence	Sexual violence many times
n=84	3 or more forms, frequently	Severe physical violence	Sexual violence a few times
Mixed (Less severe)			
n=166	Infrequent emotional abuse	Severe physical	Sexual violence a few times
n=29	Infrequent emotional abuse	Moderate physical only	Sexual violence a few times
Physical violence			
n=185	Moderate or no emotional	Severe physical	No sexual
n=75	Moderate or no emotional	Moderate physical only	No sexual
Sexual dominant			
n=25	No emotional	No physical or moderate once or twice	Once to many times
n=98	Moderate to severe emotional	No physical or moderate once or twice	Once to many times

An examination of the answer responses and matrices for each of the Brazilian and Peruvian sites yields a very similar typology of violence, with only slight variations. All sites have a category of extreme, systematic violence characterized by severe physical violence, intense emotional abuse and repeat sexual violence. Likewise, all have a category of sexual dominant violence and a category of moderate physical violence with or without emotional abuse. Additionally Cuzco province has a category that I call mixed violence (less severe). This category includes all three types of abuse, but with less intensity or severity than in the systematic category.

In order to test the robustness of this typology, I applied the same LCA techniques to two additional sites in the WHO database, Namibia and Ethiopia. Intriguingly, both sites yielded similar answer solutions, with Ethiopia yielding a four-class solution and Windhoek, Namibia, yielding a five-class solution. As in Brazil and Peru, both had classes corresponding to systematic abuse and sexual dominant abuse, although the sexual dominant category is considerably larger in the African settings compared to the Latin American sites (for details on the Namibia and Ethiopia solutions see Appendix C).

Table 5.20 Comparison of prevalence by partner violence types in Brazil, Peru, Namibia, Ethiopia

	Brazil		Peru		Namibia	Ethiopia
	Sao Paulo	Pernambuco	Lima	Cuzco	Windhoek	Rural
	4 class	4 class	4 class	5 class	5 class	4 class
No violence*	71	63	49	31	42	29
Systematic	13	17	22	25	15	19
Mixed (Less Severe)				20	18	28
Physical violence	14	16	22	16	6	
Sexual dominant	2	4	7	8	17	24

*May include emotionally abusive acts

If you explore the distribution of cases and most frequent answer combinations for the four versus five class solutions (in Peru and Brazil) or the four, five, and six class solutions (for Cuzco, Ethiopia and Namibia), what becomes apparent is that the systematic violence category remains relatively stable across model solutions, while some of the more moderate cases shift between different LCA classes. Sometimes adding a class, merely divides an otherwise coherent class—for example, going from a five to six cluster solution in Namibia breaks the sexual dominant category into two groups without adding conceptual clarity.

Given these results, I will use the four-class solution in Sao Paulo, Pernambuco and Lima, and the five-class solution in Cuzco for the rest of the thesis. Since the rate of classification error is low and entropy R^2 is close to 1 (entropy R^2 is 0.85 to 0.89 in Peru and 0.91 to 0.93 in Brazil), I will use these classifications as fixed, rather than use the underlying conditional probabilities when conducting future analysis.

Choosing a reference category. Of the 2,421 cases in Brazil and Peru that allocate to cluster 1 (no physical or sexual violence) across all sites, 771 of them (31.9%) have experienced one or more acts of emotional abuse (recall that emotionally abusive acts were allowed to allocate freely). Eighty-one percent of these cases experienced only minor emotional abuse (two or less forms infrequently), but 43 cases (5.6%) experienced intense abuse (three or more forms frequently).

To determine whether these cases could constitute a threat to having a true "no violence" reference group, I extracted these cases and examined whether they had a discernible impact on health. In the combined Brazil Peru data set, after adjusting for age, experience of child sexual abuse, partnership status, number of children, education, household SES and site (factors shown in the literature to be associated with physical and mental health outcomes), the lifetime odds of having considered suicide (aOR 1.9; 95% CI: 1.5–2.4) and reporting poor or very poor health (aOR 1.5; 95% CI: 1.2-1.8) were significantly higher for women experiencing only emotional abuse compared to women who have experienced no partner violence whatsoever (neither emotional, physical or sexual abuse). By contrast, low intensity emotional abuse was not significantly associated with lifetime suicide attempts (aOR 0.84; 95% CI: 0.52-1.3). Even relatively low levels of emotional abuse had a clear impact on key health outcomes.

Given this, I chose to remove the 771 cases where women had experienced emotionally abusive acts from my reference category and to create a category called emotional abuse only. In the remainder of the thesis, I use only women who have never experienced any partner-related abuse (whether physical, sexual or emotional) as my no violence group and report on "emotional abuse only" as a separate category (identified as "emotional only" in future analyses and tables).[19]

5.3.5 Analysis of the LCA violence types

With the newly derived LCA-defined cases of violence, we now proceed to compare these cases to those defined using the original WHO criteria. Specifically, this section explores the following questions:

- How do the cases of violence identified through LCA compare with those using the case definitions of the WHO study?
- Do the LCA classes differ in terms of either health outcomes or risk and protective factors, findings that would be consistent with the notion that they are tapping discrete types of violence?
- How do the LCA categories relate to controlling behavior, and what does this imply about whether controlling behavior is a risk factor or a defining element of partner violence?

[19] Alternatively, I could have gone back and restricted all acts of emotional abuse from allocating to cluster 1 (the no violence cluster) and redone all the LCA. The advantage of extracting these "emotionally only cases" rather than forcing them to allocate among the rest of the clusters, however, is that it allowed me to explore the nature of these cases.

Comparison of LCA classes with the WHO outcome variable (IPV-WHO)

The final LCA solution yielded the following distribution of cases across the various types of abuse. The prevalence of systematic abuse across the different sites ranges from 12.8% in Sao Paulo to 22.8% in Cuzco province. Sexual dominant violence was the least common form of abuse, ranging from only 2.1% of cases in Sao Paulo to 9.9% of cases in Cuzco province.

Table 5.21 Prevalence of different LCA categories of violence by site

	Brazil				Peru			
	Sao Paulo		Pernambuco		Lima		Cuzco province	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
No violence	484	51.5	526	44.3	358	33.0	283	18.4
Emotional only	183	19.5	223	18.8	173	15.9	192	11.9
Sexual dominant	20	2.1	48	4.0	75	6.9	118	9.9
Physical	132	14.1	189	15.9	237	21.8	252	14.2
Mixed (less severe)		n/a		n/a		n/a	304	22.7
Systematic	120	12.8	201	16.9	242	22.3	384	22.8
Total	939	100	1187	100	1085	100	1533	100

Table 5.22 crosstabulates the WHO outcome category (IPV-WHO) with the LCA outcome classes. It demonstrates that across sites, 27.4% to 43.9% of women who are in the WHO reference category of "no violence" appear as cases of "emotional only" abuse in the LCA classification scheme. The cases of IPV-WHO are split between the different LCA classes, with one-third in Cuzco rural to almost half (49.1%) in Cuzco city appearing as cases of systematic abuse.

Table 5.22 Percent of women experiencing IPV-WHO who fall into different LCA violence types

		Type of violence by LCA Class	Brazil		Peru		
			Sao Paulo	Pernam-buco	Lima	Cuzco city	Cuzco rural
IPV-WHO	No	No violence	72.6	70.2	67.4	56.1	60.7
		Emotional only	27.4	29.8	32.6	43.9	39.3
		Total	100	100	100	100	100
	Yes	Sexual dominant	7.4	11.0	13.5	n/a	14.3
		Physical	48.5	43.2	42.8	36.1	20.4
		Mixed less severe	n/a	n/a	n/a	14.8	32.6
		Systematic	44.1	45.9	43.7	49.1	32.7
		Total	100	100	100	100	100

As one might expect, the vast majority of women who experienced all three forms of abuse (physical, sexual and emotional) fall into the systematic abuse category according to LCA, although a substantial portion appear in the mixed (less severe) category in the rural parts of Cuzco (see Table 5.23).

Table 5.23 Percent of women reporting all three types of abuse (physical, sexual, emotional), by LCA abuse category

	Brazil		Peru			
	Sao Paulo	Pernambuco	Lima	Cuzco city	Cuzco rural	Cuzco combined
No violence	0	0	0	0	0	0
Emotional only	0	0	0	0	0	0
Sexual dominant	5.3	6.9	20.0	n/a	2.6	2.2
Physical	5.3	0.8	0.0	11.1	0.2	2.2
Mixed (less severe)	n/a	n/a	n/a	16.2	47.7	42.1
Systematic	89.3	92.3	80.0	72.7	49.5	53.6

Intriguingly, one of the defining differences between the mixed (less severe) and the systematic abuse category is the intensity of emotional abuse. Fully 87% of women categorized as systematic abuse experience three of more types of emotional abuse frequently whereas less than 1% of "mixed" cases experience this intensity of emotional abuse (not shown). Likewise, only 5.8% of women who make up the LCA "physical" category experience high intensity emotional abuse, and these women experienced moderate physical violence only.

A similar comparison between cases defined as "severe" by the WHO nomenclature and the LCA classes likewise confirms that this distinction splits the universe of abuse differently than does latent

class analysis. As Table 5.24 indicates, between one-fifth to one-third of severe violence cases appear in the physical violence LCA class.

Table 5.24 Percent of women reporting severe IPV-WHO, by LCA abuse category

	Brazil		Peru			
	Sao Paulo	Pernambuco	Lima	Cuzco city	Cuzco rural	Cuzco combined
No violence	0	0	0	0	0	0
Emotional only	0	0	0	0	0	0
Sexual dominant	0		2.2	n/a		
Physical	34.3	22.4	22.1	17.9	20.3	19.9
Mixed (less severe)	n/a	n/a	n/a	4.1	37.0	30.7
Systematic	65.8	77.6	75.7	77.9	42.6	49.5

Do the LCA classes differ by health impact?

Table 5.24 on the adjoining page presents the adjusted odds ratios for different health outcomes, according to different LCA categories of abuse. Without exception, the mixed and systematic categories show the strongest relationship to key health outcomes, including suicidal thoughts in the last 4 weeks, lifetime suicide attempts, perceived poor health, problems performing one's usual activities in the last 4 weeks and unwanted pregnancy. Most other classes of abuse are similarly associated with these outcomes, but with a smaller effect size. The only outcome that does not appear strongly associated with classes of abuse other than systematic violence is lifetime risk of suicide attempts.

There is a clear gradient between emotional only abuse, the two middle categories (physical and sexual dominant), and the most severe categories (mixed and systematic) in terms of impact, but there is no clear ordering between the physical and sexual dominant categories. Even with unwanted pregnancy where one might expect the link with sexual violence to be stronger, the effect size is similar between physical and sexual dominant violence (1.9 for physical and 2.1 for sexual dominant).

Table 5.25 briefly compares the effect sizes yielded by LCA-generated categories and those associated with IPV-WHO and severe IPV-WHO. Recall that severe IPV-WHO is defined solely in terms of the presence or absence of acts labeled as severe on the WHO physical violence scale. It does not take into account sexual violence or emotional abuse. The table demonstrates that when comparing severe violence as defined by WHO with "systematic violence" as defined by LCA, the effect sizes are much larger for systematic abuse, with the exception of ever having attempted suicide, where the two measures have similar effect sizes. Interestingly lifetime IPV-WHO has similar or slightly larger impacts on these health outcomes than does severe IPV-WHO. This may reflect that IPV-WHO captures sexual as well as physical violence.

Table 5.25 Adjusted odds of health outcomes among women experiencing different LCA classes of violence, combined sample Brazil and Peru

Partner violence class	Suicidal thoughts in last 4 weeks[a]		Ever attempted suicide[a]		General health status[a] poor or very poor		Problems performing usual activities last 4 weeks[a]		Last pregnancy unwanted[b]	
	AOR	95% CI	AOR	95% CI	AOR	95%CI	AOR	95%CI	AOR	95%CI
No IPV (Phys, sex or emot)	1.0		1.0		1.0		1.0		1.0	
Emotional only	1.8	(1.1, 2.9)	0.8	(0.53, 1.3)	1.5	(1.1, 2.1)	1.5	(1.2, 1.8)	1.3	(.97, 1.7)
Sexual dominant	4.4	(2.6, 7.3)	1.6	(0.90, 2.8)	1.5	(0.98, 2.3)	2.0	(1.6, 2.7)	2.1	(1.4, 3.3)
Physical	3.5	(2.3, 5.4)	1.3	(0.83, 1.9)	1.6	(1.2, 2.2)	1.6	(1.3, 1.9)	1.9	(1.4, 2.5)
Mixed (less severe)	5.2	(3.2, 8.5)	1.0	(0.57, 1.9)	2.5	(1.7, 3.7)	2.5	(1.9, 3.4)	2.3	(1.5, 3.4)
Systematic	8.1	(5.5, 11.9)	1.9	(1.3, 2.8)	2.6	(2.0, 3.4)	2.7	(2.2, 3.3)	1.7	(1.3,2.3)

a Adjusted for age, partnership status, education level, ses, number of children, child sexual abuse and site

b Adjusted for age, partnership status, education level, ses, number of children, past pregnancy termination, and site

Table 5.26 Adjusted odds of health outcomes among womenn experiencing severe violence as defined by WHO, combined sample Brazil and Peru

Partner violence class	Suicidal thoughts in last 4 weeks[a]		Ever attempted suicide[a]		General health status[a] poor or very poor		Problems performing usual activities last 4 weeks[a]		Last pregnancy unwanted[b]	
	AOR	95% CI	AOR	95% CI	AOR	95%CI	AOR	95%CI	AOR	95%CI
No IPV (Phys or sex)	1.0		1.0		1.0		1.0		1.0	
Lifetime IPV-WHO	4.2	(3.22, 5.6)	1.7	(1.3, 2..3)	1.7	(1.4,2.1)	1.9	(1.6, 2.2)	1.7	(1.4, 2.1)
Lifetime severe IPV-WHO	3.0	(2.4, 3.8)	1.8	(1.4, 2.4)	1.7	(1.4, 2.1)	1.8	(1.5, 2.2)	1.5	(1.2, 1.9)

a Adjusted for age, partnership status, education level, ses, number of children, child sexual abuse and site

b Adjusted for age, partnership status, education level, ses, number of children, past pregnancy termination, and site

Are the risk factors different for the different LCA categories?

If the different LCA classes reflect distinct "types" violence rather than a continuum of severity, one would expect to see variations in the risk factors that predict group membership. At the level of crude associations, however, we see only minimal segregation. As illustrated in Table 5.27 and Table 5.28, most respondent and partner-related risk factors traverse LCA categories in both Brazil and Peru. There is some suggestion that child sexual abuse and forced first sex may be more strongly associated with "sexual dominant" violence than with physical violence. The odds ratio for forced first sex in Brazil, for example, is aOR 8.9 for sexual dominant violence compared with aOR 2.3 for physical violence; in Peru, the same comparison is aOR 4.9 versus aOR 1.5. Likewise in Brazil, having a partner who uses illegal drugs appears to increase a woman's chance of experiencing sexual violence or systematic abuse versus physical violence (aOR 18.2 versus aOR 4.9), although the study's measure of illegal drug use is crude and does not distinguish between types of drugs.

Overall, however, there is surprising consistency across the various exposure factors. Multi-variable analyses comparing the risk factors for systematic versus IPV-WHO presented in Chapter 6 (see page 187) further confirm this impression. While this does not rule out the possibility that the various LCA categories capture distinct "types" of violence, it is equally plausible that the categories largely reflect differences in severity of a single underlying phenomenon.

Table 5.27 Age-adjusted crude odds for lifetime experience of different types of partner violence identified through LCA (Brazil)

	Emotional only		Sexual Dominant		Physical		Mixed Less Severe		Systematic (Most severe)	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds Ratio	95% CI	Odds ratio	95% CI
Respondant Factors										
Mother abused by father	1.6**	(1.2, 2.1)	2.0*	(1.1, 3.5)	2.3***	(1.7, 3.1)	na		3.1**	(1.0, 1.2)
Acceptance of wife beating							na			
1 or 2 reasons	1.3	(0.9, 1.8)	1.6	(0.8, 3.0)	2.4***	(1.8,3.3)	na		1.6**	(1.1, 2.3)
3 or more reasons	0.5	(0.3,1.1)	1.0	(0.3, 3.2)	1.4	(0.8, 2.4)	na		1.5	(0.9, 2.6)
Sexually abused as a child	1.6*	(1.0, 2.7)	3.4**	(1.5, 7.8)	2.9***	(1.8, 4.7)	na		4.4***	(2.8, 6.9)
Forced first sex	1.7	(0.7, 3.7)	8.9***	(3.6, 21.9)	2.3*	(1.1, 5.1)	na		6.7***	(3.6, 12.7)
Partner-related Factors										
Frequency of drunkeness										
less than once a month	1.6**	(1.2, 2,2)	1.6	(0.8, 3.1)	1.8**	(1.3, 2.5)	na		2.0***	(1.4, 2.8)
weekly to daily	2.8***	(1.9, 4.1)	4.0***	(2.0, 7.8)	4.6***	(3.1, 6.8)	na		8.0***	(5.6, 11.5)
Fights with other men	3.6***	(2.3, 5.6)	6.9***	(3.4, 13.8)	5.4***	(3.5, 8.5)	na		8.0***	(5.2, 12.3)
Has outside sex partners	2.6***	(2.0, 3.5)	2.8**	(1.5, 4.9)	4.1***	(3.1, 5.6)	na		4.9***	(3.6, 6.6)
Partner beaten as a child	1.8***	(1.3, 2.4)	2.1**	(1.2, 3.7)	1.9***	(1.4, 2.6)	na		3.3***	(2.5, 4.5)
Partner's mother beaten	2.3***	(1.8, 3.0)	2.9**	(1.5, 5.3)	1.8**	(1.2, 2.5)	na		3.5***	(2.6, 4.8)
Use of illegal drugs	4.6***	(2.3, 8.7)	18.2**	(5.7, 58.5)	4.9**	(1.7, 13,8)	na		10.6**	(4.1, 27.5)
Controlling behaviors							na			
1 to 2 behaviors	1.5**	(1.1, 2.0)	2.1***	(1.1, 4.0)	1.6**	(1.2, 2,2)	na		2.2***	(1.5, 3.2
3 to 6 behaviors	5.4***	(3.9, 7.6)	10.0**	(5.3, 18.9)	6.6***	(4.6, 9.3)	na		22.5**	(15.4, 32.9)

Table 5.28 Age-adjusted crude odds for lifetime experience of different types of partner violence identified through LCA (Peru)

	Emotional only		Sexual Dominant		Physical		Mixed		Systematic	
	Odds ratio	95% CI	Odds ratio	95% CI	Odds ratio	95% CI	Odds Ratio	95% CI	Odds ratio	95% CI
Respondant Factors										
Mother abused by father	1.3*	(1.0, 1.8)	1.1	(0.9, 1.2)	1.1*	(1.0, 1.2)	2.1*	(1.0, 1.2)	2.7***	(1.2, 1.2)
Acceptance of wife beating										
1 or 2 reasons	1.3	(0.9, 1.7)	2.9***	(1.8,4.4)	2.0***	(1.5, 2.7)	2.1***	(1.4, 3.1)	2.0***	(1.5, 2.6)
3 or more reasons	1.3	(0.9, 1.8)	3.4***	(2.1, 5.4)	1.4*	(1.0, 2.0)	3.6***	(2.5, 5.4)	2.8***	(2.0, 3.8)
Sexually abused as a child	2.3***	(1.5, 3.8)	3.8***	(2.3, 6.3)	2.1**	(1.4, 3.3)	2.0**	(1.3, 3.2)	5.0***	(3.4, 7.3)
Forced first sex	0.8	(0.4, 1.4)	4.9***	(3.1, 7.6)	1.5*	(1.0, 2.3)	2.1***	(1.5, 2.8)	5.3***	(3.7, 7.5)
Partner-related Factors										
Frequency of drunkeness										
less than once a month	1.2	(0.9, 1.6)	1.6*	(1.1, 2.3)	2.3***	(1.8, 3.2)	2.4***	(1.7, 3.4)	2.1***	(1.1, 1.2)
weekly to daily	4.2***	(2.3, 7.6)	5.4***	(2.7, 10,9)	6.9***	(3.9, 12.3)	10.3***	(6.4, 17.0)	27.0**	(15.9, 45.5)
Fights with other men	2.1**	(1.3, 3.5)	3.1***	(1.8, 5.2)	2.6***	(1.7, 4.0)	3.3***	(2.4, 4.5)	8.3***	(5.7, 12.1)
Has outside sex partners	2.2***	(1.4,3.5)	5.5***	(3.4, 8.7)	3.6***	(2.4, 5.2)	3.3***	(2.4, 4.5)	13,2**	(9.3, 18.4)
Partner beaten as a child	1.8***	(1.3, 2.4)	2.5***	(1.7,3.6)	2.3***	(1.8, 3.1)	2.9***	(1.5, 2.7)	4.2***	(3.2, 5.5)
Partner's mother beaten	1.8***	(1.3, 2.4)	1.7**	(1.1, 2.6)	3.3***	(2.4, 4.4)	3.0***	(2.2, 4.2)	4.6***	(3.4, 6.1)
Use of illegal drugs	1.2*	(1.0, 1.5)	1.6***	(1.3, 1.9)	1.1	(0.9, 1.3)	1.8***	(1.6, 2.2)	1.8***	(1.5, 2.0)
Controlling behaviors										
1 to 2 behaviors	1.3	(1.0, 1.7)	1.5*	(1.0, 2.2)	1.6***	(1.3, 2.1)	1.2	(0.8, 1.8)	2.5***	(1.8, 3.6)
3 to 6 behaviors	4.2***	(2.9, 6.2)	7.8***	(4.9, 12.5)	5.4***	(3.7, 7.8)	9.2***	(6.3, 13.3)	35.9**	(24.4, 52.9)

5.3.6 Exploring the battering/coercive control hypothesis

As noted previously, some feminist theorists consider coercive control as the *sina qua non* of the abuse experience (Smith, Thornton et al. 2002; Stark 2007). To many, "control" is the defining feature of battering—a form of abuse akin to the LCA category of systematic violence. In the WHO study, controlling behavior was conceptualized as a risk factor for physical and/or sexual abuse rather than a constituent part of the experience. Nevertheless, the role that control plays in partner violence is still an open question, especially in low and middle-income countries.

In Brazil and Peru, high control does not track neatly onto the abuse categories identified through LCA (see Table 5.29). Depending on the setting, between 53% and 70.7% of women experiencing systematic abuse experience high control, but this leaves a substantial share (41.8% to 46.7% in Brazil and Lima) that do not. A lower percentage of women in other abuse categories have highly controlling partners as do between 6.3% and 11.4% of women who have never experienced IPV. The share of women with controlling partners is moderately high among in Sao Paulo and Lima among women experiencing sexually dominant violence (45% and 44% respectively), and among women experiencing mixed abuse in Cuzco. In all sites, the next smallest share of women who have experienced high control are women who have experienced emotional abuse only, ranging from 12% to 29%.

Table 5.29 Level of controlling behaviors by partner, by abuse category

	No IPV	Emotional only	Sexual dominant	Physical	Mixed (less severe)	Systematic
Sao Paulo						
High control	7.6	29.0	45.0	35.6	NA	53.3
Low control	92.4	71.0	55.0	64.4		46.7
Pernambuco						
High control	10.5	24.7	33.3	30.2	NA	58.2
Low control	89.5	75.3	66.7	69.8		41.8
Lima						
High control	8.1	18.5	44.0	24.5	NA	56.4
Low control	91.9	81.5	56.0	75.5		43.6
Cuzco city						
High control	6.3	12.0	NA	31.3	47.1	62
Low control	93.8	88.0		68.7	52.9	38
Cuzco rural						
High control	11.4	23.9	31.4	26	49.6	69.3
Low control	88.6	76.1	68.6	74	50.4	30.7
Cuzco province						
High control	10.3	20.8	31.3	32.7	53.9	70.7
Low control	89.8	79.2	68.7	67.3	46.2	29.24

If one examines the proportion of systematic violence cases that fall within different a priori definitions of severe abuse, it is clear that the latent class approach is grouping cases differently than many standard ways of conceptualizing "severity," including the distinction put forward by Johnson, which prioritizes "high control" as the defining feature of abuse (see Table 5.29)

Cases defined by Johnson's approach, which are summarized in column 1, fall within all classes defined by LCA (except emotional only abuse), with nearly as many cases of Johnson-type violence (intimate terrorism) falling outside of systematic abuse as within this category (45% versus 55%). Interestingly, however, 100% of cases of systematic violence fall within the final two a priori definitions (columns 6 and 7). Both of these include severe physical violence, frequent sexual abuse, and either intense emotional abuse or high control. It would appear that the LCA category systematic, represents only the most severe, repetitive, and psychologically devastating forms of abuse.

Table 5.30 Comparison of LCA defined cases of severe abuse with different a priori definitions

	column 1	column 2	column 3	column 4	column 5	column 6	column 7
	Physical and/or sexual with high control	Physical or sexual with intense emotional abuse	Severe physical with high control	Severe physical with intense emotional	Any partner violence plus high control	Severe physical with frequent sexual and intense emotional	Severe physical with frequent sexual and high control
	% of cases	% of cases	% of cases	% of cases	% of cases	% of cases	% of cases
No violence	0	0	0	0	0		
Emotional only	0	0	0	0	14.62		
Sexual dominant	9.0	5.0	0.3	0	7.7		
Physical	22.1	13.6	12.2	4.3	18.9		
Mixed	14.3	10.6	15.5	11.3	12.2		
Systematic	54.6	70.9	71.9	84.4	46.6	100	100

I tested the possibility of using high control as one of the indicator variables in the latent class analysis, but cases did not strongly aggregate by level of controlling behaviors. Rather each category in the preferred LCA solution contained women with both high and low control, suggesting that in these settings—at least with the WHO measure of controlling behaviors—level of control is not a defining feature in how cases break out. I tested another approach in which I restricted all "high control" cases to a single class as would be consistent with the Johnson hypothesis. This strategy, however, yielded an unclear categorization scheme both statistically and conceptually. Since so many women experience "high control," the remaining cases tended to allocate to a large number (>5) of small, supplemental clusters that made little conceptual sense.

5.4 Discussion

This chapter set out to do five things: 1) document the patterning of intimate partner violence in Brazil and Peru; 2) compare cases of violence identified through LCA with cases defined using the WHO definitions; 3) examine whether the violence types identified through LCA differ in terms of either health outcomes or bi-variable risk and protective factors; 4) explore the relationship between the LCA categories and controlling behavior; and 5) consider what the above analysis suggests about the possibility of there being different subtypes of partner violence in Brazil and Peru.

Below I discuss each of these matters in turn and summarize the strengths and limitations of my analysis.

Patterning of violence in Brazil and Peru. In several key respects, the topography of partner violence in Brazil and Peru mirrors that which has been documented elsewhere in the world. For example, the degree to which partner violence dominates women's lifetime experience of interpersonal violence is consistent with the pattern found in all the other countries of the WHO study, with the exception of Samoa (World Health Organization 2005). Samoa stands out as the only WHO country where more than half of the violence experienced by adult women is perpetrated by nonpartners.

Overlap. The large overlap between sexual and physical partner violence also parallels findings from the WHO Study and from many other countries, including Indonesia, Nicaragua, Vietnam, and Turkey (Ellsberg, Peña et al. 2000; Hakimi, Nur Hayati et al. 2002; Vung, Ostergren et al. 2008; Directorate General of the Status of Women 2010). With the exception of Thailand (where 44% of abused women reported only sexual violence), 60% to 89% of women in the WHO Study who experienced sexual partner violence also experienced some form of physical abuse (World Health Organization 2005). As the authors of a recent survey replicating the WHO study in Turkey observe, "Sexual partner violence rarely occurs alone. When a women experiences sexual violence, she usually also experiences physical violence"(Directorate General of the Status of Women 2010). In the Turkish national survey, this was true for all regions and types of residences.

Severity. In all sites, more than half of all physical violence experienced qualified as severe, with the proportion ranging from 52.5% in Lima Peru to 83.8% in rural Cuzco. Among the 15 sites in the WHO study, Cuzco province has the highest proportion of abused women experiencing severe physical violence, with the remaining sites falling within the middle range of countries. With 29% and 35% respectively, Yokihama, Japan and Belgrade Serbia had the smallest proportion of women experiencing severe partner violence (World Health Organization 2005).

As elsewhere among WHO sites, women who experienced severe violence in Brazil and Peru were significantly more likely to be injured, to report needing medical care and to have left home due to the violence (World Health Organization 2005). These data confirm the distinction put forward by Straus (1996) between moderate and severe acts of abuse. In all sites, more than 91% of women who reported that they needed medical care for injuries sustained from a partner, experienced at least one act labeled as "severe."

Except in Sao Paulo and Lima, women who experienced the most severe violence, were also the least likely to fight back although in all sites, among those women who did fight back, the majority experienced severe violence. This suggests that some violence may be so severe or intimidating that it discourages women from responding in self defense, especially in rural areas where challenging male authority may be less acceptable.

Offensive violence. Between 9.3% and 25.4% of physically abused women in the five sites report at times being the first to physically aggress against their partner, although the majority report doing so on only one or two occasions. This puts Lima and Sao Paulo at the upper range among sites in the WHO study in terms of female offensive violence. They are matched only by Thailand city (28.3%) and province (23.5%), and Yokihama, Japan (33.1%). It appears that compared to settings like Bangladesh, Tanzania, and Ethiopia, women are more likely to aggress against male partners in

setting where women have gained more independence and wife beating is less socially acceptable. This is consistent with empirical findings of social psychologist John Archer who argues:

> If there is a general belief that any form of physical aggression by men against their partners is unacceptable, and this is accompanied by sanctions, this will lower the frequency of men's physical aggression. It will also increase the frequency of women's physical aggression against partners, because fewer men will hit back when their partner has hit them. If on the other hand, there is a general belief that hitting women is an acceptable way of controlling them, even if there are limits to what is acceptable, physical aggression by men against women will be encouraged. Women will not be in a good position to retaliate, through lack of societal power, the legitimizing of their husband's actions, and their lesser size and strength. It is also likely that in such societies, women's physical aggression against a partner would be seen as less acceptable than it is in a western society, because it undermines patriarchal values, and if publicized would lower the man's status in the eyes of other men (Archer 2006).

Indeed, there is evidence that a substantial share of at least moderate partner violence is mutual in many high-income countries (Tjaden and Thoennes 2000; Walby and Allen 2004; Watson and Parsons 2005; Ansara and Hindin 2009; Bair-Merritt, Crown et al. 2010).

Isolated incidents. One finding from this chapter's analysis that has not received much attention from other authors is the proportion of moderate violence that represents just one or two acts of pushing, slapping or shoving. In Brazil and Peru, half to two thirds of all women who experience only moderate violence, experience a slap, shove or push only once or twice. This represents roughly 28% of cases of physical partner violence in Brazil and Peru, except in rural Cuzco where isolated incidents represent only 10.9% of partner violence cases.

This raises the foundational question of whether the case definition of partner violence should include women who have experienced one or at most two acts of physical or sexual abuse, or whether the term should be reserved for a pattern of abusive acts, as most definitions of partner violence maintain. In the larger WHO data set, the proportion of physical violence cases that represent one or two acts of moderate physical violence varies from 10.9% in Peru's Cuzco province to 33.9% of cases in Yokihama Japan, and 45% of cases in Belgrade, Serbia. It appears that as a country develops, such acts of moderate, one-off violence make up a greater share of its overall abuse prevalence.

Presently, most authors operationalize a "case" of partner violence as any woman who has experienced one or more acts of physical or sexual violence within a specified timeframe. Some investigators have begun to exclude single incidents of moderate physical violence from their definition of partner violence, arguing that these should not be equated with more serious, repeated patterns of abuse (Watson and Parsons 2005);(Pallitto and O'Campo 2005); (Jewkes, Dunkle et al. 2010); (Dunkle, Jewkes et al. 2004). This decision affects both the reported "prevalence" of partner violence and potentially the relative symmetry of perpetration of violence between men and women. There is evidence from studies that have interviewed both men and women (e.g. in Cote d'Ivoire and Ireland), that a greater share of female perpetrated violence involve single acts of moderate violence such as slapping, shoving or pushing (Watson and Parsons 2005; Hossain 2011).

If these acts are included in the definition of abuse, rates of perpetration appear more symmetrical between men and women.

I am sympathetic to the view that a single slap, push, or shove is neither conceptually nor experientially equivalent to a pattern of persistent abuse. This is especially true if women reporting one or two acts of moderate violence have not also experienced sexual partner violence or emotional abuse. Future researchers should explore the pros and cons of excluding these cases or identifying them differently, perhaps as "incidents." Whether and how they are counted will influence both reported prevalence rates and potentially the perceived credibility of the statistics. Within the full WHO database, reported prevalence of IPV-WHO would decline between 2.3 to 8.7 percentage points depending on the site, if isolated incidents of moderate physical aggression were excluded from reported rates of abuse [data not shown]. Further research into the health and social impacts of such incidents and the meaning women ascribe to them, could help inform future decisions around the boundary conditions for the "partner violence" label.

Utility of the latent class approach. This chapter successfully used latent class analysis to identify a typology of violence that appears robust across a range of low and middle-income settings, including Brazil, Peru, Ethiopia and Namibia. In each of the settings, there is a similar breakdown of cases, consisting of a "no violence" group that includes instances of infrequent emotional abuse; a "physical violence" group that includes few if any instances of sexual violence and infrequent emotional aggression; a "sexual dominant" group that includes sexual violence with occasional acts of physical abuse and infrequent emotional aggression; and a "systematic violence" group, that includes repeated acts of severe and moderate physical violence, multiple acts of sexual violence and high intensity emotional abuse. Additionally, some sites appear to have a fifth category that I labeled "mixed (less severe)," which includes women who have experienced all three types of violence but to a lesser degree than the women in the systematic abuse category.

For the purposes of analysis, I created a separate class of women who experienced emotional abuse only by removing them from the no violence group. Significantly, though, an "emotional abuse only" group did not emerge spontaneously from the latent class analysis.

The category that appears the most stable across geographic setting is "systematic abuse." Regardless of the number of classes selected or the starting restrictions applied, a similar proportion of cases end up in the systematic abuse category. By contrast, more moderate cases sometimes shift between classes as one moves from a four to a five-cluster solution. This suggests that these distinctions are less stable, at least for women reporting one of the less-dominant answer patterns.

The primary advantage of the LCA approach is that it acknowledges that women frequently experience multiple, overlapping forms of violence. LCA accommodates this reality, allowing cases to be defined in terms of different combinations of physical, sexual and emotional abuse. This tactic contrasts sharply with traditional approaches to defining partner violence that frequently ignore emotional abuse entirely and define cases by type of violence, not women's experience.

A comparison between LCA categories and the IPV-WHO confirms that LCA divides the universe of cases differently than the WHO case definition. Neither "severity" nor "experiencing all three forms of violence" categorize cases in the same manner as latent class analysis.

Different phenomena. . .or different levels of one phenomenon? One of the key applications of LCA to date in high-income countries has been to investigate the Johnson hypothesis that there are distinct "types" of partner violence that differ in their mutuality, level of control, motivation, impact, and etiology. Most authors have interpreted their findings as largely supporting Johnson's thesis, although no study has had the data necessary to truly test his theory.

Without more detailed data on the context and motivation behind particular acts, and data from both women and men on perpetration and victimization, it is impossible to evaluate whether Brazil and Peru have types of partner violence that parallel Johnson's distinctions between situational couple violence and intimate terrorism. My goal, however, was more modest—to see whether there is any evidence to suggest that there may be distinct types of partner violence in Brazil and Peru.

My findings do suggest classes of violence that differ by strength and size of association with different risk factors and health effects. Across almost all health outcomes and risk factors, the associations are weakest and effect sizes smallest for emotional only abuse and strongest and largest for systematic abuse. The effect sizes are in between for physical and sexual dominant violence, with few clear distinctions between them.

All authors who have used LCA to date have made similar findings, concluding that the methodology yields important distinctions in types of violence. Likewise, all have identified a distinct class of severe, multifaceted violence that is associated with the most severe health and social consequences (Watson and Parsons 2005; Carbone-Lopez, Kruttschnitt et al. 2006; Frye, Manganello et al. 2006; Ansara and Hindin 2009). While this could represent—as Johnson argues—potentially separate types of violence with distinct consequences and etiologies, it could just as easily reflect differences in severity of an underlying unitary phenomenon. If risk factors had differed more by LCA class or the association for the same factor had changed direction across classes, then the case for separate phenomenon would be stronger.

One LCA study did find some suggestion of differences in risk factors using data from Canada's 1993 Violence against Women survey (Macmillan and Gartner 1999). While prefacing their conclusion with a call for more research, Macmillan and Gartner argue:

> Our analyses indicate distinctive correlates and perhaps distinctive etiologies for the different types of violence. Thus the practice of a priori distinguishing serious violence from violence that is less serious may be misleading because it conflates conflictual and controlling forms of violence, as well as systematic and nonsystematic wife abuse." p. 957

To explore this issue further would require research that collects detailed data on the patterning of violence and the context and unfolding of specific violent events (preferably from both women and men). Individuals could be allocated to a specific category of violence using LCA and researchers could return to interview in depth a random subset of respondents from each category. Insights from these qualitative interviews could be used to decide whether the classes seem to vary in fundamental ways beyond frequency and severity of acts.

The relevance of control. Johnson's thesis also rests on the notion that the defining distinction between the different types of violence is the context and motivation of control. This chapter's findings, however, are not consistent with this proposition. Both the latent class findings and the

factor analysis findings suggest that the WHO control scale is tapping a different latent construct than the violence sub-scales, and that the emotional abuse questions serve as a better indicator variable than the control questions for identifying categories of abuse (i.e. the LCA yielded more coherent models using sexual, physical and emotional violence than combinations that included control). While a greater proportion of women experiencing high control did allocate to the systematic violence class, a substantial proportion distributed elsewhere, including 6 to 11% that appeared in the "no physical or sexual violence" class.

Although tentative, my findings are consistent with a number of studies that have begun to question the veracity of the Johnson typology. Kirsten Anderson, for example, used data from the 1996 US National Violence against Women Survey to evaluate the IT/SCV typology and to explore whether the outcomes of partner violence are worse if they occur in the context of high control. She concludes:

> In terms of predictive power [in terms of health and social consequences], the distinction between violence that occurs in combination with high control (IT) and violence that does not occur in conjunction with high control (SCV) gains little over a simple measurement strategy of counting the number of types of violent acts that respondents experiences. This result is striking considering the limitations of the continuous violence scale, used in this study, which does not adequately capture either the frequency or severity of violence (Anderson 2008)."

Other studies have also yielded results suggesting that control is a separate, independently important construct for the purposes of predicting negative health outcomes. In a cross-sectional study of women presenting for antenatal care in Soweto South Africa, for example Kristen Dunkle and colleagues found that the experience of intimate partner violence and high relationship control were both independently associated with newly diagnosed HIV infection, even after controlling for age, relationships status and the woman's HIV risk behavior (Dunkle, Jewkes et al. 2004). In both this and a later prospective study (Jewkes, Dunkle et al. 2010), the association between HIV and relationship control persisted even after adjusting for physical or sexual partner violence. As the authors point out:

> The lack of confounding or statistical interaction between partner violence and SRPS score (the study's measure of relationship control) in our multi-variable analysis of HIV risk suggests that these measure tap into different, and equally important underlying constructs (p.1419).

Choice of outcome variable. Given the above analysis, I have chosen to focus my analysis of individual-level risk factors for partner violence on systematic abuse and IPV-WHO. Systematic abuse is the most stable and consistent category across settings and it corresponds to the most severe form of abuse. Whether or not systematic violence turns out to fundamentally different from the other types of violence, it will remain a category of particular interest to those seeking to help victims.

Conceptualizing IPV for future research. More broadly, I recommend that the field continues to explore LCA as a means of identifying cases of partner violence, placing special emphasis on establishing a common set of "indicator" variables for standardized use across studies. Until there is

relative agreement on indicator variables, it will be impossible compare findings across studies. In the mean time, the evolving standard of constructing a binary variable based on acts of physical or sexual violence is adequate, with two important refinements. First, future research should ensure that all analysis is done against a true "no partner violence" reference group. This means excluding women who have experienced "intense" emotional aggression, as defined by the breadth and frequency of acts. Second, since most conceptual definitions of abuse refer to "a pattern of behaviour" rather than isolated acts, researchers should distinguish between "incidents of assault" and "cases" of partner violence. Further, because my research suggests that single acts of moderate-only violence have limited impact on health, such incidents should be excluded from the case definition of abuse and from estimates of population-level prevalence. Investigators may, however, wish to report these incidents separately.

Strengths and limitations. The primary strength of this chapter is the application of LCA to the question of partner violence in five low and middle-income settings (with additional confirmatory work undertaken in Ethiopia and Namibia). To my knowledge, this is the first study of its kind to apply this technique in low or middle-income countries.

The analysis, however, does have shortcomings, many related to limitations in the original WHO data. As with all violence surveys, the findings are based on self reports and therefore may over or underestimate the true occurrence of events. Most investigators maintain that women tend to underreport rather than over-report violence, especially those types of violence that are highly stigmatized, such as child sexual abuse (Schwartz 2000; Walby and Myhill 2001; Ellsberg and Heise 2005). Despite extensive efforts to maximize disclosure (such as ensuring absolute privacy), underreporting is probably a factor in the WHO study as well.

Likewise, the focus on lifetime partner violence means that some of women's responses may apply to more than one perpetrator. In the combined data set, however, only 18% of women (n=423) who have experienced IPV-WHO have been married or lived with a man more than once, and only 3% (n=77) more than twice. Not all of these women will have been abused by both men, making it even less likely that women's response patterns reflect more than one perpetrator. While I could have limited this bias by including only current partners or current abuse, this strategy would likely have limited the number of "severe" violence cases that I would have captured because studies demonstrate that women are more likely to have left severely abusive partners than less abusive ones (Ellsberg, Winkvist et al. 2001; World Health Organization 2005; Ansara and Hindin 2009).

A further limitation relates to the scope of data available on violent events. As previously mentioned, the WHO questionnaire only asked questions regarding impact and coping of women who had experienced physical violence; therefore it is impossible to compare LCA classes along these important dimensions. Future LCA analysis would benefit from additional information on the degree of fear associated with the abuse, its impact on a woman's life, the mutuality of the aggression, and her motivations for perpetration.

Chapter 6: Identifying Individual and Relationship-Level Factors that Influence the Risk of Partner Violence

Guiding questions

1. What respondent and partner-related factors influence a woman's risk of experiencing lifetime partner violence?
2. What relationship-related factors influence a woman's risk of experiencing lifetime partner violence?
3. Do these factors differ between systematic abuse and partner violence as defined in the WHO study (hereinafter referred to as IPV-WHO?
4. Does relationship conflict and quarrelling appear to mediate the relationship between any of the factors and increased risk (i.e. does some of the effect appear to be a function of arguments about certain issues)?
5. To what extent are effect sizes influenced by the reference group chosen?
6. To what degree can analysis based on IPV-WHO yield accurate insights into risk factors for systematic abuse?

6.1 Introduction

This chapter analyzes the individual- and relationship-level factors associated with intimate partner violence. It is based on the ecological framework presented in Figure 2.4, which conceptualizes partner violence as arising from a combination of factors that partners bring to a relationship (individual dispositions, genetic endowments, and experiences from early childhood), aspects of both partner's current situation (e.g. their use of alcohol or illegal drugs, their educational attainment; their employment status) and aspects of their current relationship (e.g. how long they have been together, their degree of couple communication, and the level of couple conflict). Community- and macro- level factors that may likewise affect the odds of violence or may moderate the impact of factors operating at an individual level are considered in chapters 7 and 8.

6.2 Methods

6.2.1 Selection and construction of measures

Outcome variables

For the purposes of this analysis, I chose two primary outcome variables: lifetime experience of *systematic abuse* by an intimate partner, as identified through latent class analysis and lifetime experience of physical or sexual violence by an intimate partner, as measured in the WHO study (IPV-WHO). As described in Chapter 5, cases of systematic partner violence are characterized by severe physical violence, high intensity emotional abuse and frequent sexual assault. As such, they

closely resemble the type of abuse cases seen in refuge and shelter populations and known as "battering" in the North American literature.

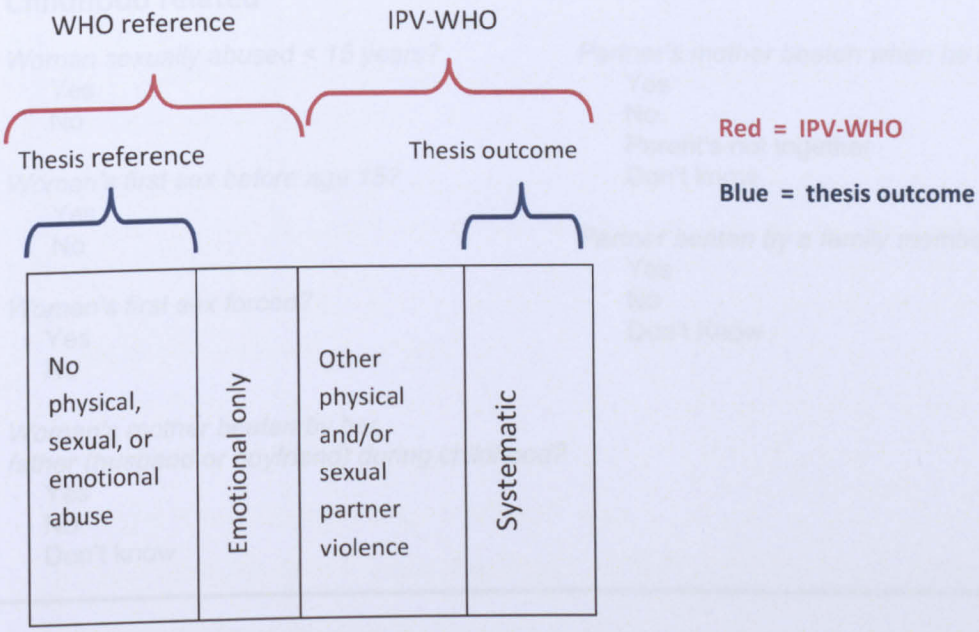
My primary interest is in the risk and protective factors for systematic abuse, because severe repetitive abuse represents a significant public health problem. Although more moderate forms of violence may affect more women at a population level, severe, systematic abuse has been shown to cause the majority of injury and long term health consequences of abuse. Moreover, there are methodological advantages to focusing on systematic violence, given that as a category, it appears the most stable and consistent across settings.

The inclusion of the standard IPV-WHO outcome, however, allows me to explore how the risk factors for systematic abuse compare to those of IPV-WHO and to compare the findings from Brazil and Peru to the extant literature, which focuses almost exclusively on physical violence alone or physical and/or sexual partner violence (i.e. IPV-WHO). Including both outcomes likewise allows me to evaluate the appropriateness of applying insights from risk factor analysis undertaken using IPV-WHO to cases of more severe abuse.

Current versus lifetime partner violence. I chose to focus on the lifetime risk of systematic abuse rather than its 12-month prevalence for two reasons. One, because systematic abuse is far less common than IPV-WHO, I was concerned that I would not have adequate power to explore the large range of factors that I anticipated testing at different levels of the social ecology if I only looked at current cases. Also, past studies in both high and low-income settings have demonstrated that the most serious cases of partner violence are found among ex-partners, and could be missed if I only examined cases of current abuse (McNutt and Lee 2000; Ellsberg, Winkvist et al. 2001; Ansara and Hindin 2009). Data from both Brazil and Peru hold to the same pattern. Given my focus on lifetime risk, I adjust all analyses in this chapter for the respondent's age, in order to control for length of exposure to possible risk of partner violence.

Because analysis from Chapter 5 demonstrated that even moderate levels of emotional abuse were associated with negative health outcomes, I selected women who have experienced *no* acts of physical, sexual or emotional aggression as the reference category for systematic abuse. By contrast, the IPV-WHO measure includes women who may have experienced emotional aggression without physical or sexual violence in its reference category. At the end of the chapter, I explore the impact that this choice of reference category has on analysis of risk and protective factors, using the IPV-WHO definition.

Figure 6.1 Thesis outcome measure versus IPV-WHO outcome



Exposure variables

The study included four sets of exposure variables, summarized in Tables 6.1 to 6.3, corresponding to: 1) experiences in early childhood of both the woman and her partner; 2) a set of factors related to the woman's adult life situation; 3) a set of factors related to her partners' adult life situation; and 4) factors related to the couples' relationship. Variables that are not self-explanatory, are explained below.

1. Early childhood factors

Child sexual abuse. To assess whether women were sexually abused as a child, they were asked: "Before the age of 15 years, do you remember if anyone in your family ever touched you sexually or made you do something sexual that you didn't want to?" If the woman answered no, she was asked follow up probes about possible other perpetrators: How about someone at school? How about a friend or neighbor? Has anyone else done this to you?

In addition to asking directly about sexual abuse, the study gave all women an opportunity to disclose anonymously at the end of the interview by marking a picture code (a sad versus happy child's face) and placing the folded piece of paper into a see-through bag that contained answer cards from other respondents. Anonymous disclosures were linked to particular women in some sites, but not in Brazil or Peru.

Table 6.1 Childhood related exposure variables assessed in this study

Childhood related

Woman sexually abused < 15 years?
Yes
No

Woman's first sex before age 15?
Yes
No

Woman's first sex forced?
Yes
No

Woman's mother beaten by her father (husband or boyfriend) during childhood?
Yes
No
Don't know

Partner's mother beaten when he as a child?
Yes
No
Parent's not together
Don't know

Partner beaten by a family member as a child?
Yes
No
Don't Know

Sexual initiation. Women were asked how old they were when they first had sexual intercourse and whether it was voluntary. Specifically women were asked:

- How old were you when you first had sex?[20]
- How would you describe the first time that you had sex?
- Would you say: you wanted to have sex; you did not want to have sex but it happened anyway; you were forced to have sex?

Women who reported that they were forced, were coded as "forced first sex"; all other sex was considered voluntary, even if not particularly wanted.

2. Respondent factors: Adult life situation

Attitudes toward wife abuse. Women were asked whether "a man has a good reason to hit his wife" in 6 possible situations: She does not complete her household work to his satisfaction; she disobeys him; she refuses to have sexual relations with him; she asks him whether he has other girlfriends; he suspects that she is unfaithful; he finds out that she has been unfaithful.

Acceptance of male dominance. Women were asked if they agreed or disagreed with the following statements: A good wife obeys her husband even if she disagrees. It is important for a man to show

[20] The question did not define "sex", but the question-by-question interviewer guidance instructed them to say "generally thought of as intercourse," if the woman explicitly asked what is meant by "sex."

his wife/partner who is the boss. It is a wife's obligation to have sex with her husband even if she doesn't feel like it.

Problematic alcohol use. Women were coded as problem drinkers if they responded positively to having experienced within *the past 12 months* any of the following because of their drinking: money problems, health problems, conflict with family or friends, problems with authorities (bar owners, police, etc), or any other problem.

Household SES. The WHO study adapted an asset index, originally developed for the DHS surveys, as a proxy indicator for socioeconomic position. The methods used for calculating the WHO wealth index are described elsewhere (Filmer and Pritchett 2001; Vyas and Kumaranayake 2006). Briefly, an index of economic status for each household was constructed using principal components analysis (PCA) based on the following variables:

- Source of water
- Sanitation facility
- Type of roofing electricity in household
- Ownership of durable items (e.g. TV, car, motorbike, telephone, refrigerator, bicycle)
- Ownership of land
- Ownership of one's house.

Weights for the individual variables, derived from PCA, were used to construct a single index of SES, according to the following formula:

$$\left\{ \frac{\text{Value of variable} - \text{mean of socioeconomic variable}}{\text{Standard deviation of socioeconomic variable}} \right\} \times \text{socioeconomic variable factor}$$

Rather than using predetermined cutoffs, such as terciles, houses were classified into either low, medium or high SES. This was based on k-means cluster analysis, a technique that assigns cases to a fixed number of groups by maximizing the separation between them (Kanungo, Mount et al. 2002).

Table 6.2 Women's current situation exposure variables assessed in the study

Woman related factors

Woman's age
- 15-19
- 20-29
- 30-39
- 40-49

Education completed
- 0 to 8 years
- 9 to 11 years
- 12 or more years

Partnership status (woman)
- Currently married, living together
- Living together, not married
- Regular partner, living apart
- Separated, divorced, widowed

SES (household)
- Low
- Medium
- High

Attitudes toward wife abuse
- Accepts one or more of 6 reasons for a man to beat his wife
- Accepts none of 6 reasons for a man to beat his wife

Acceptance of male dominance
- Accepts one or more of 3 statements endorsing male dominance
- Accepts none of 3 statements

Number of living children
- 0 to 1
- 2 to 3
- 4 or more

Can count on family for support
- Yes
- No

Works for cash
- Yes
- No

Ownership of assets
- Owns land, house, or business in her own name
- Owns land, house or business only with others
- Owns none of the above

Contribution to household income
- More than husband/partner
- Less than husband/partner
- About the same

Problematic drinking (past 12 months)
- Reports one or more of 5 problems related to alcohol
- Reports none of 5 problems

Age at first sex (in years)

Sexual assault by a nonpartner after age 15
- Yes
- No

Physical assault by a nonpartner after age 15
- Yes
- No

3. Partner-related factors: Adult life course

A similar set of questions were posed to women about her current or most recent partner including his age, level of education achieved, employment status, and a number of queries about his current and past behavior (see Table 6.3).

Table 6.3 Partner and relationship-level variables assess in the study

Partner related factors

Partner's age
- 15-19
- 20-29
- 30-39
- 40-49
- Over 50

Level of controlling behaviour
- None
- 1 to 2 controlling behaviors
- 3 to 6 controlling behaviors

Frequency of partner observed drunk
- Never
- Once a month or less
- Weekly to daily

Use of illegal drugs
- Never
- In the past, not now
- Yes
- Don't know

Employment Status
- Employed/retired/student
- Unemployed

Outside sexual partners
- No
- Maybe, not sure
- Yes

Fights with other men
- No
- Yes

Relationship factors

Relationship duration
- Less than 1 year
- 1 to 5 years
- More than 5 years

Couple communication
- Low
- Medium
- High

Marital conflict
- Rarely
- Sometimes
- Often

Controlling behavior. Women were asked whether their partners generally exhibited each of six controlling behaviors. These include: trying to keep her from seeing her friends, restricting her access to her family of birth, insisting on knowing where you are at all times, getting angry if she speaks with another man, is often suspicious that she is unfaithful, and expects her to ask his permission before seeking health care for herself. Question 703d (ignores you or treats you indifferently) of the WHO controlling behavior scale was not included because factor analysis revealed that it loaded with the emotional abuse rather than the control questions.

Frequency of drunkenness. Partners were coded according to how frequently the woman had observed their partner drunk in the previous 12 months (never, once a month or less, weekly to daily).

Fights with other men. Women were queried about whether their partner had been involved in a physical fight with another man since she had known him.

4. Relationship factors

Couple communication. Interviewers inquired whether partners discuss the following topics together: things that happen to him during the day, things that happen to her, his worries or feelings, her worries or feelings. Based on the pattern of distribution, partners who discuss none of the four topics were coded as "low." Those who discusssed two or three of the topics were coded as "medium." Those who discussed all four were coded as "high."

Relationship duration. Relationship duration was coded as: less than 1 year, 1 to 5 years, more than 5 years. The cutoff points were chosen to explore whether the risk of partner violence is higher in newly formed relationships, as found in some other studies (Dunkle, Jewkes et al. 2004) (Ellsberg, Peña et al. 2000; Yoshihama, Clum et al. 2002).

6.2.2 Identifying appropriate partner information to analyze

The WHO questionnaire collects lifetime information from women on their experience of violence but descriptive information only about their current or most recent partner. This raises the possibility that the data we have on some women's partners may not relate to the characteristics of their *violent* partner. The WHO questionnaire includes an "exposure table" that asks women to recount all of their cohabiting relationships, including when the relationship began, when it ended, whether that partner physically or sexually mistreated her, and the month and year of the first and last incident of violence. From this table and the respondent's answers to questions about her current or most recent relationship, one can identify partner data that correspond to men other than the partner who abused her.

To identify the appropriate partner-related data to include in the analysis, I created a series of variables from the exposure table that isolated 212 cases where a woman's current or most recent partner was not her violent partner (4.5% of 4,754 ever-partnered women).

Additionally, there were 216 cases in which missing data made it impossible to characterize the most recent partner as the violent partner. I reduced the number of "unknowns" to 128 cases (2.6% of all ever-partnered women) by reclassifying those reporting violence within the last 12 months as

current or most recent partner violent. This accommodation might introduce some misclassification because the "current" violence that a woman reports could theoretically be perpetrated by a partner prior to her most recent partner. Nevertheless, the vast majority of these women were currently living with a partner (rather than separated or divorced), so this situation should be uncommon.

Next I explored whether the cases with missing data were systematically different from those without missing data by comparing three different groups of cases: victims of violence whose current or most recent partner was violent, victims of violence whose current or most recent partner was not violent; and victims of violence missing data on which partner was violent. This analysis revealed that the women missing data on which partner was violent *do* appear systematically different than those without missing data. In fact, they seem to have fewer of the risk factors normally associated with experiencing partner violence. Women whose partner's have missing data have fewer children and are more educated than those without missing data. Likewise, their partners are significantly less likely to have been beaten as child ($p=.001$); their mothers are less likely to have been beaten ($p<.001$); they drink less ($p<.001$) and they are less likely to have been seen drunk in the last year ($p<.001$). In sum, the partners with missing data are more like those who have not perpetrated partner violence than those who have.

Given this, I chose to eliminate the 128 cases with missing data from the analysis of risk and protective factors. Leaving them in or taking them out could introduce a small systematic bias. Either way, these cases account for only 2% of cases of partner violence (IPV-WHO) in Sao Paulo, Pernambuco and Cuzco, and less than 5% of cases in Lima.

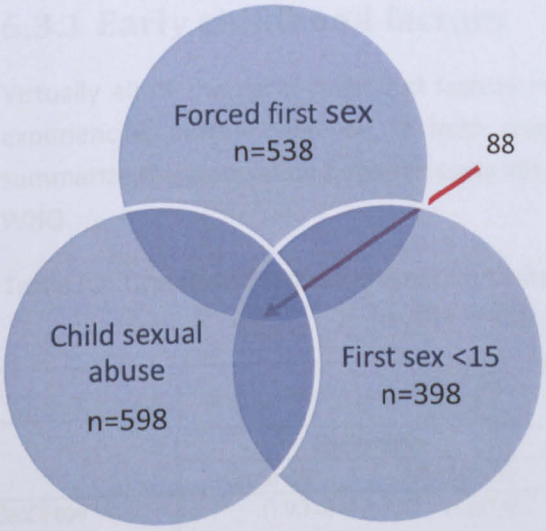
Overlap in categories. It is likely that there is unintended overlap in the categories of forced first sex and child sexual abuse, depending on how women interpreted these questions and the question on age at first sex. Some victims of child sexual abuse may have reported their first sex as forced and some may have not (e.g. if when they became sexually active later it was voluntary or if they experienced nonpenetrative childhood sexual abuse). This could dilute the association between forced first sex and later partner violence.

To explore this possibility I examined the degree of overlap in the various categories. In Peru and Brazil together, 530 women report their first sex as forced (with eight answers missing), ranging from 2.5% of all sexually active women in Sao Paulo to 22.6% of sexually active women in rural Cuzco province (see Table 6.4). There are 88 cases where women report both forced first sex under age 15 and being sexually abused before age 15—representing the potential overlap (see Figure 6.2). These cases represent one quarter to one third of the women who report their first sex as forced in all sites except rural Cuzco, where they account for only 7% of cases (22/313) (see Table 6-4).

Table 6.4 Potential overlap in questions regarding forced first sex and child sexual abuse, by site

	Sexually active women	First sex forced		First sex < 15		First sex <15 and forced		CSA & forced sexual initiation <15	
	n	n	%	N	% of all first sex	n	% of all first sex	n	% of all first sex
Sao Paulo	1,170	29	2.5	88	7.5	12	1	8	0.68
Pernambuco	1,470	53	3.6	210	14.3	23	1.6	17	1.2
Lima	1,411	80	5.7	64	4.5	29	2.1	27	1.9
Cuzco city	450	55	12.2	25	5.5	14	3.1	14	3.1
Cuzco rural	1,382	313	22.6	11	0.01	42	3.0	22	1.6
Missing	13	8							
Total	5890	538		398		120		88	

Figure 6.2 Potential overlap between first sex and child sexual abuse



This suggests that up to 16% (88/538) of women reporting forced first sex may be referring to the same set of acts under both the forced first sex and sexual abuse labels. Likewise, among women who report "never having had sex," between 2.5% in Pernambuco and 17.5% in Lima report being sexually abused as a child, suggesting that these women either experienced nonpenetrative abuse or chose not to label the abuse as "sex." Without further information, it is impossible to establish the degree to which question wording may have distorted responses to the child abuse, age at first sex, and forced first sex questions.

6.2.3 Analytic strategy

My choice of variables was informed by my revised ecological framework (Figure 2.4, Chapter 2), an evaluation of those factors that were associated with systematic abuse in bi-variable analysis, and the pathway diagrams (Figures 3.1 and 3.2, Chapter 3) that I developed depicting my hypothesized relationships among variables related to partner violence victimization and perpetration (see pages 81 and 88 for copies of the diagrams).

Of all the variables tested, only duration of relationship emerged as not significantly associated with age-adjusted lifetime systematic partner violence or IPV-WHO. Consequently, I eliminated this variable from further consideration.

In addition, despite the fact that both physical and sexual assault by nonpartners in adulthood emerged as strongly associated with both types of partner violence in all four sites, I chose not to include these in my model because I believe the associations are a function of a set of common risk factors from childhood, rather than a causal association between violence by nonpartners and violence in intimate relationships. I can think of no reasonable hypothesis save excessive alcohol use or a "neighborhood-level" effect that would suggest why a woman who is beaten by her husband would be more likely to be raped or physically assaulted by a nonpartner. By contrast, there is substantial evidence in the literature suggesting that women sexually abused in childhood, for example, are at increased risk of revictimization in adolescence and adulthood (Messman-Moore and Long 2003);(Roodman and Clum 2001) (Dunkle, Jewkes et al. 2004; Arriola, WLouden et al. 2005; Fargo 2009; Maniglio 2009);(Barnes, Noll et al. 2009).

All analysis was conducted using Generalized Estimating Equations with robust standard errors in STATA 11.0`

6.3 Findings

6.3.1 Early childhood factors

Virtually all of the early childhood factors measured were positively associated with the odds of experiencing partner violence, in both crude and adjusted analysis. Table 6.5 and Table 6.6 summarize the association between early life events and the risks of both systematic abuse and IPV-WHO.

Table 6.5 Childhood factors associated with lifetime partner violence; crude and adjusted odds by site and type of violence, BRAZIL

	Sao Paulo BRAZIL			Pernambuco BRAZIL		
	Systematic		IPV-WHO	Systematic		IPV-WHO
	Crude OR[a]	Adjusted OR[b]	Adjusted OR[b]	Crude OR[a]	Adjusted OR[b]	Adjusted OR[b]
Respondent's age	1.1* (1.0,1.3)	1.2** (1.0,1.4)	1.1** (1.0,1.3)	1.2** (1.1,1.3)	1.2*** (1.1,1.4)	1.1** (1.1,1.2)
Respondent sexually abused as a child (<15 yrs)	4.7*** (2.3,9.6)	2.7* (1.0,7.1)	2.0** (1.2,3.5)	4.3** (2.3,8.2)	2.0 (0.8,4.5)	2.3** (1.3,4.2)
First sex < 15 years	4.7*** (2.4,9.1)	3.2* (1.2,8.3)	2.5** (1.3,4.6)	4.4*** (2.9,6.5)	3.7*** (2.3,6.0)	3.0*** (2.1,44.2)
First sex forced	7.0*** (1.8,27.3)	2.0 (0.3,12.9)	1.6 (0.7,3.8)	6.5*** (3.1,13.9)	4.1** (1.6,10.3)	2.7** (1.4,5.3)
Woman's mother beaten	4.4*** (2.8,7.0)	3.7*** (2.4,5.8)	2.5*** (1.8, 3.3)	2.5*** (1.7,3.6)	1.7** (1.1, 2.6)	1.6** (1.2, 2.2)
Partner's mother beaten	3.3*** (1.9,5.3)	2.4** (1.4,4.3)	2.0*** (1.4, 2.9)	3.9*** (2.6,6.0)	2.8*** (1.7,4.5)	1.8** (11.3, 2.5)
Partner beaten as child	3.0*** (1.9,4.7)	2.2** (1.4,3.6)	1.5** (1.1, 2.2)	4.0*** (2.8, 5.7)	3.2*** (2.1,4.8)	1.9*** (1.4,2.6)
Observations	604	600	935	727	725	1183

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ [a] Adjusted for age; [b] Factors adjusted for all other factors in table

Table 6.6 Childhood factors associated with lifetime partner violence; crude and adjusted odds by site and type of violence, PERU

	Lima PERU			Cuzco Province PERU		
	Systematic		IPV-WHO	Systematic		IPV-WHO
	Crude OR[a]	Adjusted OR[b]	Adjusted OR[b]	Crude OR[a]	Adjusted OR[b]	Adjusted OR[b]
Respondent's age	1.1* (1.0,1.2)	1.1* (1.0,1.3)	1.0 (0.9,1.1)	1.1*** (1.1,1.4)	1.2*** (1.1,1.4)	1.1* (1.0,1.2) 1.4 (0.8, 2.3)
Respondent sexually abused as a child (<15 yrs)	5.7*** (3.6,8.8)	4.1*** (2.3,7.4)	2.2*** (1.5,3.1)	8.7*** (3.8,19.9)	5.8*** (2.2,15.5)	
First sex < 15 years	8.4*** (3.4,20.6)	2.5 (0.7,8.7)	2.4* (1.0,5.8)	1.9** (1.1,3.4)	1.2 (0.6,2.5)	1.0 (0.6,1.5)
First sex forced	9.7*** (4.4,21.5)	5.8*** (2.3,14.6)	3.7*** (2.0,7.1)	3.9*** (2.5, 6.1)	3.5*** (2.1,5.8)	3.2*** (2.1,4.7)
Woman's mother beaten	2.5*** (1.7,3.6)	1.7* (1.1,2.6)	1.8*** (1.4,2.3)	2.6*** (2.0,3.6)	2.0*** (1.5,2.8)	1.6*** (1.3,2.1)
Partner's mother beaten	5.1*** (3.4, 7.8)	3.2*** (1.9,5.1)	2.3*** (1.7,3.2)	3.5*** (2.2,5.4)	1.9** (1.1,3.2)	1.7** (1.2-2.7)
Partner beaten as child	3.4*** (2.4,4.8)	2.3*** (1.5,3.5)	1.9*** (1.4,2.6)	4.6*** (3.1,6.8)	3.4*** (2.2,5.3)	1.7*** (1.3-2.2)
Observations	598	589	1072	667	661	1524

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ [a] Adjusted for age; [b] Factors adjusted for all other factors in table

Child sexual abuse. The adjusted odds of experiencing systematic partner violence if a woman is sexually abused as a child varies from 2.0 (95% CI:0.8,4.5) in Pernambuco Brazil to 5.8 (95% CI:2.2,15.5) in Cuzco province. In all sites, the crude odds ratio is larger than the age-adjusted crude odds ratio, suggesting some degree of confounding or mediation in this group of variables, most likely between child sexual abuse, the circumstances of first sex, and growing up in home where one's mother has been beaten by her partner.

Age and voluntariness of sexual debut. The circumstances of first sex also appear linked in Brazil to the experience of both systematic and IPV-WHO in adulthood. In Sao Paulo and Pernambuco, early sexual debut (younger than age 15) significantly increases the odds of systematic partner violence and IPV-WHO, even when her decision to become sexually active is voluntary. The increased odds vary from 3.0 (95% CI: 2.1, 44.2) for IPV-WHO in Pernambuco to 3.7 (95% CI: 2.3, 6.0) for systematic abuse in the same state. The odds ratios for systematic abuse in Peru are also positive, but they do not reach statistical significance, except in Lima for IPV-WHO. Pearson chi-square tests confirm that in all sites, the earlier a woman reports her first sex, the more likely it is to have been forced (chi2(1)=104.64, p<.001 for the combined sample; data not shown).

Whether sexual initiation is forced or voluntary similarly affects later risk of intimate partner violence. In all sites (except Sao Paulo) the odds of experiencing systematic violence and IPV-WHO are significantly elevated if a woman's first intercourse is forced. Among women 15 and older whose first sex is forced, the adjusted odds of experiencing partner violence range from 2.7 (95% CI: 1.4,5.3) for IPV-WHO among women in Pernambuco to 5.8 (95% CI: 2.3,14.6) for systematic partner violence in Lima Peru. In Sao Paulo, the odds are elevated by 60% for IPV-WHO and are twice as

high for systematic violence. The association, however, is not significant, probably due to the small numbers.

Women's mother beaten. A significant factor for later risk of partner violence is witnessing partner violence as a child or growing up in a home where one's mother is beaten. This factor emerged as strongly linked to the experience of systematic abuse and to IPV-WHO. As illustrated in Table 6.5 and Table 6.6, the adjusted odds of systematic abuse in adulthood ranges from 1.7 (95% CI: 1.1, 2.6) in Pernambuco, Brazil and Lima, Peru (aOR 1.7; 95% CI: 1.1,2.6) to 3.7 in Sao Paulo, Brazil (95% CI: 2.4, 5.8) if the respondent reports that her mother was beaten. Adjusted odds for IPV-WHO were lower, but still highly significant. Odds were also elevated for both types of abuse if the woman reported that she "doesn't know" if her mother was beaten when she was a child, compared to women reporting that their mother was *not* beaten (not shown). Tests for interaction between mother beaten and child sexual abuse and between age at first sex and forced first sex were negative.

Partner's mother beaten. An even stronger association exists between systematic abuse in adulthood and having an intimate partner whose mother was beaten. Here the odds ratios ranged from 1.9 in Cuzco Province (95% CI:1.1,3.2) to 3.2 in Lima Peru (95% CI:1.9,5.1). Although the odds of abuse increased substantially if the mothers of both partners are beaten, there was no evidence of interaction between these variables, according to the Wald test.

Partner beaten. A woman who reported that her partner was beaten as a child by a family member had elevated odds of experiencing both IPV-WHO and systematic abuse. The odds ratio for systematic abuse varied between 2.2 (95% CI: 1.4, 3.6) in Sao Paulo Brazil to 2.3 (95% CI: 1.5, 3.5) and 3.4 (95% CI: 2.2, 5.3) in the Peruvian sites. Interestingly there is a large difference between the crude and the adjusted odds for a man being beaten in childhood when the model is adjusted for the partner's mother being beaten. For example, in Lima the crude odds for systematic abuse (adjusted for respondent's age) goes from 3.2 (95% CI: 2.0,5.0) to 2.4 (95% CI: 1.4, 4.0) after mother beaten is added to the model [not shown]. This suggests that these experiences may overlap and/or derive at least in part from a common underlying factor.

Mediation and confounding in early childhood factors. I conducted additional analysis to explore the degree to which early first sex and/or forced first sex mediate the association between child sexual abuse and later risk of systematic partner violence. This relationship was hypothesized in the pathways diagram that I constructed for women's risk of experiencing partner violence. Table 6.7 and Table 6.8 explore these relationships in greater detail for Sao Paulo and for Cuzco.

Table 6.7 Relationship among childhood variables predicting systematic partner violence, Sao Paulo, BRAZIL

	Systematic partner violence							
		Model 1		Model 2		Model 3		Model 4
	Crude OR [a]	aOR	95% CI	aOR	95% CI	aOR	95% CI	a OR	95% CI
Respondent's age	1.1*	1.2**	[1.1,1.3]	1.1*	[1.0,1.3]	1.2**	[1.1,1.4]	1.2**	[1.1,1.3]
Sexually abused < 15 yrs	4.7***	3.8***	[1.7,8.2]	4.0*	[1.9,8.6]	3.5**	[1.6,7.8]	3.6**	[1.6,7.8]
First sex <15	4.7***	3.9***	[1.8,8.4]			3.5**	[1.6,7.9]		
First sex forced	7.0**			4.0§	[0.9,19.3]	2.2	[0.4,13.3]		
First sex <15 and forced	10.7**							5.1**	[1.6,7.8]
Observations	604	602		602		601		601	

§ p<0.1; *p<0.05 ; ** p<0.01; *** p<0.001; a/ adjusted for respondent's age

Table 6.8 Relationship among childhood variables predicting systematic partner violence, Cuzco Province, PERU

	Systematic partner violence							
		Model 1		Model 2		Model 3		Model 4
	Crude OR [a]	aOR	95% CI	aOR	95% CI	aOR	95% CI	aaOR	95% CI
Respondent's age	1.2***	1.2***	[1.1,1.4]	1.2***	[1.1,1.4]	1.2***	[1.1, 1.4]	1.2***	[1.1,1.4]
Sexually abused < 15 yrs	8.7***	7.7***	[3.4,17.2]	6.9***	[3.0,16.0]	6.6***	[2.9.15.1]	6.6***	[3.0,14.6]
First sex <15	1.9*	1.3	[0.7,2.4]			1.2	[0.6,2.2]		
First sex forced	3.9***			3.5***	[2.2,5.5]	3.5***	[2.2,5.6]		
First sex <15 and forced	8.5**							4.0*	[1.0,16]
Observations		663		665		662		662	

§ p<0.1; *p<0.05 ; ** p<0.01; *** p<0.001; a/adjusted for respondent's age

The crude (age adjusted) OR in Sao Paulo for lifetime odds of systematic abuse if a women reported sexual abuse in childhood was 4.7. This reduced to 3.8 when sex before age 15 was added to the model, suggesting that part of the effect of child sexual abuse is mediated through early sex. The aOR for child sexual abuse also declines to 4.0 when adjusted for forced first sex.

The reduction is even greater when force and early sex are considered together. When a woman in Sao Paulo experiences forced first sex *and* sex before the age of 15, her age adjusted, crude odds of experiencing systematic partner violence was 10.7. When adjusted for the presence of child sexual abuse, her odds decline to 5.1 (95% CI: 1.6, 7.8) suggesting that there may indeed be some overlap in categories that is inflating the crude OR.

The same pattern of sexual abuse being mediated through early sex and forced first sex is apparent in Cuzco province (see Table 6.8). Appendix D presents tables that demonstrate that similar patterns likewise exist in Brazil and Peru as a whole for both IPV-WHO and systematic abuse.

6.3.2 Partner-related factors only

Table 6.9 and Table 6.10 summarize the adjusted odds of lifetime systematic abuse and IPV-WHO by site based exclusively on different partner-related factors. Each model incorporates both the factors that emerged as relevant for male partners in the early childhood analysis as well as variables that address men's current situation.

Table 6.9 Adjusted odds of systematic partner violence by partner-related factors, by site[§] (Partner only: Blocks 2+3 from Figure 4.3)

	Sao Paulo systematic aOR	95% CI	Pernambuco systematic aOR	95% CI	Lima systematic aOR	95% CI	Cuzco systematic aOR	95% CI
Partner's Age	1.4	[0.8,2.2]	1.1	[0.8,1.6]	0.7	[0.5,1.1]	0.9	[0.6,1.5]
Partner's mother beaten								
Yes	3.6***	[1.7,7.5]	2.7***	[1.5,5.0]	2.5**	[1.3,4.9]	1.7	[0.8,3.6]
Parents not together	2.2	[0.4,10.8]	2.7	[0.8,9.6]	2.0	[0.6,6.4]	2.5	[0.6,9.5]
Partner beaten as a child								
Yes	1.8	[0.7,4.1]	2.9***	[1.5,5.4]	2.4**	[1.3,4.6]	2.8**	[1.4,5.5]
Don't know	5.3***	[2.3,12.0]	2.1*	[1.1,4.1]	2.2	[0.9,5.7]	3.3***	[1.6,6.8]
Partner unemployed	0.6	[0.2,1.7]	0.6	[0.3,1.4]	1.5	[0.7,3.4]	0.7	[0.2,2.2]
Frequency of drunkenness								
Once a month or less	1.0	[0.3,3.0]	1.6	[0.9,2.8]	1.6	[0.9,3.0]	1.1	[0.6,2.3]
Weekly to daily	6.7**	[2.0,23.0]	4.1***	[2.2,7.8]	8.9***	[2.4,32.8]	9.5***	[3.1,29.4]
Partner uses/used illegal drugs	3.7*	[1.2,11.6]	1.9	[0.5,6.6]	2.5***	[1.6,3.8]	1.2	[0.9,1.6]
Level of control								
1 to 2 controlling behaviors	1.5	[0.8,2.9]	3.0***	[1.7,5.3]	3.3***	[1.7,6.2]	1.9*	[1.1,3.5]
3 to 6 controlling	15.3***	[7.4,31.4]	16.4***	[9.2,29.2]	33.0***	[17.0,64.1]	28.3***	[13.3,60.3]
Partner has fought with other men	3.1	[1.0,10.2]	7.3***	[3.2,16.7]	4.8**	[1.5,15.4]	3.3**	[1.6,6.9]
Partner has outside sex partners								
Yes	2.9**	[1.5,5.6]	2.2**	[1.2,3.8]	7.3***	[3.5,15.5]	11.5***	[5.4,24.6]
Don't know	2.8	[0.5,15.3]	0.5	[0.2,1.4]	2.9**	[1.3,6.4]	2.2*	[1.1,4.4]
Partnership status								
Living together, not married	2.6*	[1.2,5.6]	3.9***	[2.1,7.0]	5.6***	[2.7,11.7]	2.5**	[1.3,4.7]
Regular partner, living apart	0.4	[0.1,1.5]	0.8	[0.2,2.9]	0.8	[0.2,2.6]	0.1*	[0.0,1.0]
Separated, Divorced	3.3*	[1.1,10.1]	2.8*	[1.2,6.3]	0.7	[0.3,1.6]	1.7	[0.6,4.5]
Observations	564		695		563		638	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. § All values in table controlled by respondent's age.

Table 6.10 Adjusted Odds of IPV-WHO abuse by partner-related factors, by site[§] (Partner only: Blocks 2+3 from Figure 4.3)

	IPV-WHO Sao Paulo		IPV-WHO Pernambuco		IPV-WHO Lima		IPV-WHO Cuzco	
Partner's Age	1.0	[0.8,1.2]	1.2*	[1.0,1.3]	0.9	[0.8,1.1]	1.1	[1.0,1.3]
Partner's mother beaten								
Yes	2.2***	[1.4,3.3]	1.5*	[1.0,2.2]	2.6***	[1.8,3.8]	1.5*	[1.0,2.1]
Parent's not together	5.7**	[1.6,20.9]	0.6	[0.2,1.7]	3.8***	[1.8,7.9]	1.2	[0.6,2.3]
Partner beaten as a child								
Yes	1.4	[1.0,2.1]	1.6**	[1.1,2.3]	1.7**	[1.2,2.4]	1.4*	[1.1,2.0]
Don't know	1.4	[0.8,2.5]	1.6	[1.0,2.8]	1.0	[0.6,1.7]	1.8**	[1.2,2.5]
Partnership status								
Living together, not married	1.6*	[1.1,2.4]	2.2***	[1.6,3.0]	1.8**	[1.2,2.6]	1.2	[0.9,1.6]
Regular partner, living apart	0.3***	[0.1,0.6]	0.5	[0.3,1.0]	0.5*	[0.3,0.8]	0.4*	[0.2,0.9]
Separated, divorced	2.2*	[1.2,4.1]	1.7*	[1.0,2.9]	0.4**	[0.3,0.7]	0.9	[0.6,1.6]
Partner unemployed	1.3	[0.8,2.3]	1.0	[0.6,1.6]	1.3	[0.8,2.1]	0.9	[0.6,1.6]
Frequency of drunkenness								
Once a month or less	1.5	[0.9,2.7]	1.1	[0.8,1.5]	1.6**	[1.1,2.3]	1.6***	[1.2,2.1]
Weekly to daily	3.3***	[1.9,5.8]	2.2***	[1.5,3.2]	3.7***	[1.8,7.6]	3.5***	[2.3,5.4]
Partner uses/used illegal	1.7	[0.9,3.0]	1.1	[0.4,3.0]	1.4*	[1.0,2.0]	1.2*	[1.0,1.4]
Level of control								
1 to 2 controlling behaviors	1.3	[0.8,2.0]	1.7**	[1.2,2.4]	2.0***	[1.4,2.9]	1.0	[0.8,1.4]
3 to 6 controlling behaviors	3.5***	[2.3,5.3]	4.9***	[3.4,7.1]	6.4***	[4.2,9.8]	4.3***	[3.0,6.1]
Partner has fought with other men	2.3**	[1.4,4.0]	2.4***	[1.4,3.9]	1.8*	[1.0,3.1]	2.2***	[1.6,3.1]
Has outside sexual partners								
Yes	2.4**	[1.4,4.0]	2.4***	[1.7,3.4]	4.4***	[2.8,6.8]	3.0***	[2.0,4.4]
Don't know	1.3	[0.6,2.6]	1.0	[0.5,1.9]	2.1**	[1.3,3.3]	1.7**	[1.1,2.4]
Observations	868		1135		1005		1461	

Exponentiated coefficients; 95% confidence intervals in brackets $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Although increasing partner age was significantly associated with lifetime risk of both systematic and IPV-WHO in all sites in the crude analysis, partner's age becomes insignificant for both types of violence in San Paulo and Lima when adjusted for the other partner-related factors (and respondent's age). In bi-variable analysis, lifetime risk of partner violence increases as the age of woman's partner increases, declining somewhat in men over 50.

Both factors that emerged as significant for partners in the childhood model—witnessing marital violence as a child and being beaten oneself—remain positively and independently associated with lifetime odds of both systematic abuse and IPV-WHO in adjusted analysis, with most sites reaching statistical significance.

Having a partner who is unemployed does not appear to consistently increase risk of either systematic or IPV-WHO in any setting.

By contrast, having a partner who is frequently drunk substantially increases a woman's risk of being abused in all sites and for both measures of violence. Among women whose partners are drunk on a weekly to daily basis, the adjusted odds of her experiencing IPV-WHO vary from 2.2 (95% CI: 1.5,3.2) in Pernambuco to 3.7 (95% CI: 1.8, 7.6) in Lima. The effect size is even greater in the case of systematic abuse, where the aORs reach 8.9 (95% CI: 2.4,32.8) and 9.5 (95% CI: 3.1, 29.4) in Lima and Cuzco, declining somewhat to 6.7 (95% CI: 2.0, 23.0) in Sao Paulo and 4.1 (95% CI: 2.2, 7.8) in Pernambuco. The wide confidence intervals here reflect the smaller number of systematic versus IPV-WHO cases available in the sample. Similar but less dramatic associations are present for other measures of alcohol use, including frequency of drinking and volumes consumed per drinking session (results not shown).

The relationship between partner violence and current or past use of illegal drugs is both less dramatic and more variable across settings than that observed for the abuse of alcohol. If a man uses or has used illegal drugs, a woman's odds for experiencing systematic abuse are universally elevated, but the association reaches statistical significance only in Sao Paulo and Lima (aOR=3.7 in Sao Paulo and aOR=2.5 in Lima). For less severe forms of abuse, drug use modestly increases the odds of IPV-WHO in all settings, but significantly so only in Peru (aOR=1.4 in Lima and aOR=1.2 in Cuzco).

The final three factors considered—level of controlling behavior, fights with other men, and having outside sexual partners—all demonstrate consistent, independent, and statistically significant relationships to women's future risk of both systematic and IPV-WHO across all sites. The link between high partner control and risk of partner violence appears especially strong. In Brazil, the odds that a woman will experience systematic abuse are elevated 15 to 16 times for women who report that their partners' exhibit 3 to 6 controlling behaviors and 28 to 33 fold for similar women in Peru. The odds for those who experience IPV-WHO are substantially less but nonetheless quite high, ranging from aOR 3.5 (95% CI: 2.3, 5.3) in Sao Paulo to aOR 6.4 (95% CI: 4.2, 9.9) in Lima. As illustrated in Table 6.9 and Table 6.10, men known to fight with other men are roughly twice as likely to commit IPV-WHO and three to seven times as likely to commit systematic abuse as men who don't engage in male fighting. Likewise, women are at heightened risk when their partner is known to have other sexual partners outside of the relationship. Here the increased odds for regular IPV-WHO vary from 2.4 in both Brazilian sites to 4.4 (95% CI: 2.8, 6.8) in Lima. The adjusted odds are

roughly the same for women suffering systematic and IPV-WHO in Brazil but substantially elevated among women experiencing systematic abuse in Peru (aOR = 7.3 in Lima and 11.5 in Cuzco).

6.3.3 Respondent-related factors (women's model)

Table 6.11 and Table 6.12 present a stepwise progression of models exploring respondent-related factors associated with women's experience of systematic partner violence in Peru and Brazil. Similar tables summarizing factors associated with IPV-WHO are presented in Appendix E.

Table 6.11 Crude and adjusted odds of partner violence (systematic) – Women's model, Brazil (Blocks 1+4 from Figure 4.3)

	Age-adjusted	Model 1	Model 2	Model 3	Model 4	Model 5	Model 5
CHILDHOOD FACTORS	Crude OR	Aor	aOR	aOR	aOR	aOR	95%CI
Age respondent	1.1***	1.2***	1.3***	1.2*	1.1*	1.2**	[1.06,1.35]
Sexually abused <15yrs	4.4***	2.4**	2.3**	2.0*	2.0	1.7	[0.83,3.40]
First sex							
< 15 years	4.7***	3.1***	2.4***	2.0**	2.0***	2.1**	[1.25,3.46]
Forced	6.7***	3.4**	2.4*	2.3*	2.3	2.3	[0.72,7.28]
Mother beaten							
Yes	3.1***	2.8***	2.5***	2.3***	2.3***	2.3***	[1.56,3.27]
Don't know	5.2***	4.5***	3.7**	3.8**	4.8***	5.3***	[2.1,13.30]
Site= Pernambuco	1.6**	1.4*	1.2	1.1	1.0	1.1	[0.74,1.64]
SOCIO-DEMOGRAPHIC							
Education (Ref=0 to 8)							
9 to 12 years	0.4***		0.7	0.7	0.8	0.8	[0.48,1.27]
12 or more years	0.2***		0.4**	0.5*	0.5	0.6	[0.28,1.08]
Partnership status (ref=married)							
Living together, not married	4.5***		3.0***	2.8***	2.8***	2.8***	[1.85,4.22]
Regular partner, living apart	3.0***		2.9***	4.0***	4.8***	5.5***	[2.48,12.3]
Separated, divorced, widow	10.4***		8.8***	13.1***	11.5***	7.4***	[3.17,17.3]
Household SES (Ref: low)							
Medium	0.6***		0.8	0.8	0.9	0.9	[0.59,1.36]
High	0.3***		0.6	0.7	0.7	0.7	[0.33,1.41]
CURRENT SITUATION							
Number of living children							
2 to 3	2.0***			2.0**	2.0**	1.8*	[1.13,3.01]
4 or more	3.8***			2.4**	2.5**	2.5**	[1.34,4.51]
Problems from alcohol in past year	5.9***			3.8**	3.5**	3.3*	[1.21,9.07]
Acceptance of wife beating	1.3**			1.1	1.0	1.1	[0.73,1.41]
Acceptance of male dominance (ref=none)							
Accepts 1 to 2 norms	1.1			0.8	0.9	0.9	[0.60,1.42]
Accepts 3 or 4 norms	1.4			0.8	0.8	0.9	[0.54,1.51]
Assets (land, house, business)							
Owns independently	1.1			1.6*	1.6*	1.9**	[1.21,3.05]
Owns with others	0.4***			0.7	0.7	0.8	[0.50,1.15]
Works for cash	1.2			1.1	1.2	1.2	[0.79,1.87]
Contribution to family income							

Same as partner	1.2			1.1	1.1	1.0	[0.56,1.66]
More than partner	2.2***			2.2**	2.0*	1.8*	[1.01,3.19]
Doesn't know	2.2***						
Can count on family for support	0.3***			0.5**	0.6*	0.5**	[0.34,0.83]
RELATIONSHIP FACTORS							
Couple communication (ref=High)							
Medium	3.4***				2.9***	2.2***	[1.47,3.21]
Low	6.1***				4.6***	3.2***	[1.80,5.83]
Frequency of quarrels (ref=Rarely)							
Sometimes	1.9***					1.6**	[1.17,2.31]
Often	31.1***					20.9***	[10.2,42.9]
Observations		1326	1321	1259	1259	1259	

Exponentiated coefficients; 95% confidence intervals in brackets; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.12: Crude and adjusted odds of partner violence (systematic) – Women's model, PERU (Blocks 1+4 from Figure 4.3)

	Age-adjusted	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model5*
CHILDHOOD FACTORS	Crude OR	aOR	aOR	aOR	aOR	aOR	95% CI
Age respondent	1.0***	1.2***	1.3***	1.2**	1.2*	1.3**	[1.1,1.4]
Child sexual abuse	5.0***	4.5***	4.5***	4.8***	4.4***	5.0***	[2.9,8.6]
First sex							
< 15 years	3.4***	1.4	1.2	0.9	1.0	1.0	[0.4,2.7]
Forced	5.3***	4.0***	3.6***	3.3***	3.3***	3.4***	[2.0,6.0]
Women's mother beaten	2.7***	2.3***	2.2***	2.1***	2.0***	1.7**	[1.2,2.5]
Site=Lima	0.5***	0.5***	0.6***	0.6*	0.6*	0.6*	[0.3,0.9]
SOCIO-DEMOGRAPHIC							
Education (Ref=0 to 8)							
9 to 12 years	0.8*		1.0	1.0	0.9	1.0	[0.6,1.8]
12 or more years	0.4***		0.5***	0.5*	0.5*	0.4**	[0.2,0.7]
Partnership status (ref=married)							
Living together not married	2.6***		2.6***	2.7***	2.4***	2.6***	[1.7,4.1]
Regular partner living apart	1.5		2.4**	4.7**	5.0**	4.1*	[1.1,14.8]
Separated, divorced, widowed	4.3***		4.9***	9.2***	6.8***	3.7*	[1.2,11.3]
Household SES (Ref: Low)							
Medium	1.2***		1.4	1.3	1.5	1.2	[0.7,2.0]
High	0.6***		1.1	1.1	1.2	1.1	[0.6,2.0]
CURRENT SITUATION							
Number of living children (ref=0-1)							
2 to 3	1.9***			2.5***	2.5***	2.0**	[1.2,3.2]
4 or more	3.7***			3.5***	3.4***	2.5**	[1.3,4.8]
Problems from alcohol past year	3.4***			3.2***	3.2***	2.6***	[1.6,4.4]
Acceptance of wife beating	1.7***			1.2	1.1	1.2	[0.9,1.6]
Male dominance norms (ref=none)							
Accepts 1 to 2 norms	1.5**			0.9	0.8	0.8	[0.5,1.3]
Accepts 3 or 4 norms	2.0***			0.9	0.7	0.7	[0.4,1.3]
Assets (land, house, business)							
Owns independently	1.3			0.7	0.7	0.8	[0.5,1.3]
Owns with others	0.8			0.6*	0.6*	0.6*	[0.4,0.9]
Works for cash	1.4*			1.1	1.1	1.1	[0.7,1.7]
Contribution to family income							
Same as partner	1.1			1.2	1.3	1.1	[0.7,1.7]
More than partner	2.7***			3.5***	3.0***	2.1*	[1.1,4.0]
Don't know	1.8***						
Can count on family for support	0.4***			0.6*	0.7	0.8	[0.4,1.1]
RELATIONSHIP FACTORS							
Couple communication (ref=High)							
Medium	1.1***				4.0***	3.2***	[2.0,5.1]
Low	0.4***				3.7***	2.2*	[1.0,4.8]
Frequency of quarrels (ref=Rarely)							
Sometimes	5.8***					4.0***	[2.8,5.8]
Often	5.6***					26.1***	[13.1,52.1]
Observations		1054	1054	1054	1054	1054	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

I chose to present the women's model in stepwise fashion to illustrate the impact that adjustment has on the point estimate of key variables. Model 1 includes only childhood factors and a dummy variable for site. Model 2 adds sociodemographic variables, including education, household SES, and partnership status. Model 3 adds a range of variables corresponding to the women's current situation, including variables related to her number of children, attitudes and beliefs, economic independence, and social support. Models 4 and 5 add two key relationship variables: frequency of couple communication and marital conflict. This final variable is included to assess whether part of the association between partner violence and aspects of the couples' current life circumstance is mediated through marital conflict.

Women's education. In both Brazil and Peru, women who completed more than 12 years of education were significantly less likely to suffer systematic partner violence than women with fewer years of education. The adjusted OR was 0.5 in both countries, prior to the addition of relationship-level variables. Less than 12 years of education, however, appeared to offer little or no protective effect against violence, suggesting that the benefits associated with education do not accrue until secondary school is completed.

Women's partnership status. Women who live with their partner but are not married—as well as women who are separated, widowed or divorced—have higher odds of experiencing systematic abuse than women who are formally married. In analysis adjusted for childhood and socioeconomic factors, for example, the odds of systematic violence among women who are separated or divorced in Peru are five-fold higher than among women whose marriages are still intact (aOR 4.9. 95% CI; 3.3, 7.4).

Women's alcohol use. Although the direction of causality is unclear, women's problematic alcohol use is strongly and significantly associated with risk of systematic partner violence in the respondent only model in both Brazil and Peru with an adjusted OR of 3.8 (95% CI: 1.6, 8.7) in Brazil and 3.2 (95% CI: 2.0, 4.9) in Peru. One of my hypotheses has been that women and men's drinking behavior may be a source for marital argument and disagreement in addition to any other way that alcohol may work to increase risk of violence. Indeed, there is evidence in both the Brazil and Peru data that alcohol may partially operate in this way.

In Peru, for example, the increased odds of systematic violence associated with women's problematic alcohol use declines from 3.2 to 2.6 when frequency of marital quarrelling is added to the model. While poor couple communication also significantly elevates the odds that a woman will be abused, poor communication alone does not have such a dramatic impact on the odds ratio of problematic alcohol use. Rather, it is frequency of arguing that seems to partially mediate the effect. Drinking—along with transgressing gender norms, challenging male authority, and arguing over money—may be one of the many issues that populate the "conflict arena" and serve to trigger violent attacks (see Tables 6.11 and Table 6.12 and the revised ecological model, Figure 2.4).

Number of children. There is also evidence in the Peru data that a similar dynamic may be at work in the association between number of children and the odds of systematic partner violence. Having many children is strongly and significantly associated with risk of partner violence in all sites, with the adjusted odds ratio for 4 or more children in Brazil reaching 2.4 (95% CI:1.4, 4.4) and 3.5 in Peru (95% CI:2.0, 6.1). Again, the odds drop significantly when frequency of quarrelling is added to the

model (from 3.5 to 2.5). As with women's drinking, poor couple communication does not appear to mediate this effect; rather, it is arguing that appears critical. It is not difficult to imagine how the demands of having many children puts stress on a relationship and provides fodder for conflict. This may represent one of several pathways through which having children elevates risk.

Women's economic situation. While the "working for cash" variable loses its significance in both sites when adjusted for other variables, several of the other economic variables yield interesting findings. In both Brazil and Peru, women who contribute more than their partner to the maintenance of the family are at increased risk of systematic partner violence. The OR for systematic abuse, adjusted for childhood, sociodemographic and current situation variables, is 2.2 in Brazil and 3.5 in Peru. Women who contribute the same as their partner are neither protected nor put at risk.

Ownership of assets appears to operate somewhat differently in the two countries. In Brazil, women who own substantial assets in the form of land, a house or a business in their own name (i.e. independently) are at increased risk of systematic partner violence, whereas in Peru, they have slightly decreased odds, although not significantly so. By contrast women in Peru who own assets with their partner or someone else, have significantly lower odds of systematic partner violence (aOR 0.6: 95% CI: 0.4,1.1).

Family support. Women who could count on their family for support were significantly protected from violence in the woman-only model. The adjusted OR was 0.5 in Brazil and 0.6 in Peru, both statistically significant.

Non-significant factors. Among the factors modelled, only household SES, individual attitudes accepting of wife beating or male authority, and working for cash were not predictive of a woman's risk of systematic violence after adjusting for other factors.

6.3.4 Combined model for systematic abuse

Table 6.13 presents a final model describing factors associated with a women's lifetime risk of experiencing severe, systematic partner violence in both Brazil and Peru. For comparison purposes, I have left in the models all factors that emerged as significant in at least one setting during earlier stages of model building (including childhood, respondent, partner and relationship factors). Also given the possible conceptual and measurement overlap between the relationship variable "frequency of quarrels" and my outcome measure, I present two versions of each model—one that includes the final relationship variables and a second that does not.

Table 6.13 Combined women and partner model for partner violence (Systematic), Brazil and Peru

	BRAZIL		PERU		
	Systematic Without relationship	Systematic With relationship	Systematic Without relationship	Systematic With relationship	
	aOR	aOR	aOR	aOR	95% CI
CHILDHOOD FACTORS					
Age of respondent	1.3***	1.3***	1.2*	1.2*	[1.1,1.5]
Sexual abuse <15 yrs	1.0	0.8	3.4***	4.6***	[2.4,8.7]
First sex < 15 yrs	2.6***	2.9***	0.7	0.6	[0.2,1.6]
First sex forced	2.1	2.2	2.5**	2.8**	[1.5,5.3]
Women's mother beaten	2.8***	2.8***	1.3	1.3	[0.9,2.0]
Partner's mother beaten	2.5***	2.3***	2.0**	2.2**	[1.3,3.6]
Partner beaten as a child	1.8***	1.9***	1.7***	1.7***	[1.2,2.2]
CURRENT SITUATION					
Level of schooling					
9 to 11th	1.0	1.0	0.8	0.9	[0.5,1.6]
12 or higher	0.7	0.7	0.6	0.5*	[0.3,0.9]
Partnership status					
Living together, not married	2.9***	3.0***	3.8***	3.7***	[2.3,6.1]
Regular partner, living apart	2.2	2.9	2.4	2.4	[0.6,9.4]
Separated, divorced, widow	4.0**	3.2*	1.2	0.6	[0.2,1.8]
HH socio-economic status					
Medium	0.9	1.0	1.6	1.4	[0.8,2.5]
High	0.6	0.6	1.4	1.3	[0.7,2.6]
Number of living children					
2 to 3 children	2.1**	2.0*	2.3**	2.1*	[1.1,4.1]
4 or more	2.3*	2.1*	3.5**	3.1**	[1.3,7.1]
Women's problematic drinking	1.8	1.7	1.7	1.6	[0.9,2.9]
Assets (land, house, business)					
Owns independently	1.8*	2.0**	0.7	0.7	[0.4,1.2]
Owns with someone else	0.8	0.9	0.6*	0.6	[0.4,1.0]
Woman works for cash	1.2	1.2	1.4	1.5	[0.9,2.5]
Contribution to family income					
Contributes same as partner	1.0	1.0	1.3	1.2	[0.7,2.1]
Contributes more than partner	2.0	2.4*	1.5	1.2	[0.5,2.7]
Can count on family for support	0.8	0.8	0.9	1.1	[0.6,1.8]
Partner unemployed	0.6	0.5	0.7	0.7	[0.4,1.5]
Level of controlling behavior					
1 to 2 controlling behaviors	2.2***	2.2***	1.7*	1.4	[0.8,2.3]
3 to 6 controlling behaviors	14.9***	11.5***	17.1***	11.5***	[6.7,19.7]
Frequency of drunkenness					
Less than once a month	1.6	1.4	1.5	1.4	[0.9,2.3]
Weekly to daily	3.5***	2.1*	13.7***	11.2***	[4.1,30.4]
Partner uses/used illegal drugs	2.5*	2.6*	1.4*	1.3	[1.0,1.7]
Partner fights with other men	4.8***	4.4***	3.7***	3.3***	[1.7,6.3]

Partner has outside sexual partners	1.8*	1.7*	7.4***	6.2***	[3.6,10.7]
site==Pernambuco (less urban)	0.8	0.9			
site==Cuzco (less urban)			1.3	1.1	[0.6,1.8]
RELATIONSHIP					
Couple communication (ref: high)					
Medium		1.4		2.4***	[1.5,3.9]
Low		2.8***		2.1	[0.7,6.3]
Frequency of quarrelling (ref: rarely)					
Sometimes		1.5		2.6***	[1.7,4.0]
Often		10.0***		15.5***	[6.7,35.8]
Observations	1301	1301	1176	1176	

Childhood factors. In both countries and all models, having a partner who was beaten as child or who grew up in home where his mother was beaten roughly doubles a woman's odds of systematic violence. The impact of a woman having a mother who was beaten is more variable. In Brazil, growing up in a home where one's mother is beaten increases a woman's odds of systematic violence almost three fold (aOR 2.8; 95% CI:1.8, 4.3), but in Peru, the impact is more modest (aOR 1.3; 95% CI 0.9, 2.0) and not significant.

Child sexual abuse emerges as a strong risk factor in Peru, even after adjustment for other risk factors, whereas in Brazil, sexual abuse before 15 is no longer significant. In Brazil, however, sexual initiation before age 15 has a large effect size, suggesting that in Brazil the impact child sexual abuse is being mediated through early sexual initiation. (As noted earlier, there also may be some measurement confusion between these two categories). In Peru, women who are sexually abused prior to age 15 have odds of partner violence in adulthood that are 4.6 times greater than women who do not report sexual abuse, even after adjustment for current situation and relationship factors. Recall that the rate of sexual abuse in childhood is considerably higher in Peru than Brazil, with almost 1 in 5 women from Lima reporting having been sexually abuse prior to age 15, compared to 6% in Pernambuco state (see Table 6.11).

Partner-related factors. By far, the variables most consistently linked to a woman's odds of systematic violence are factors related to her partner. The strongest risk factor in both Brazil and Peru is having a partner who exhibits highly controlling behavior. The risk for women whose partner's exhibit 3 to 6 controlling behaviors listed are 14.9 fold higher in Brazil and 17.1 fold higher in Peru than women with noncontrolling partners. Frequent drunkenness also emerges as highly significant in both countries as does fighting with other men, use of illegal drugs, and having outside sexual partners. Having an unemployed partner appears to be the only partner-related factor that does not increase a woman's odds of systematic partner violence.

Respondent-related factors. Many of the previously important respondent factors lose their significance in the combined model, although the effect size and direction of association remain largely the same. Completing secondary education still appears protective but it achieves statistical significance only in the full model from Peru. Reporting social support from one's family no longer appears effective at reducing risk, having a nonsignificant odds ratio close to 1. Women with

drinking problems continue to have odds 60% to 80% higher than women without alcohol problems, though this factor no longer achieves significance in the combined model. By contrast, having many children remains a strong and significant risk factor for partner violence in both Brazil and Peru, as does living with a partner outside of formal marriage. In both settings, women with two to three children have twice the odds of experiencing systematic abuse and women in Peru have 3.5 times the odds if they have four or more children.

Variables probing women's economic independence appear to operate differently depending on how they interact with different power dynamics in the family. Women who have access to cash through paid employment or the informal sector have slightly higher odds of systematic abuse, but the difference is not statistically significant in either Brazil or Peru. Paradoxically, those who own assets in their own name—such as land, a house, or a business—have twice the odds of violence in Brazil as either women who own no assets or women who own assets together with their husband or someone else. Likewise, women who contribute more than their partner to the maintenance of the household are at significantly greater risk in Brazil than women who contribute the same as their partner, or those who contribute less. A test for interaction between relative contribution to family income and male control of female behavior was significant, suggesting that gender attitudes and male control may moderate the effect of women's economic status on risk of partner violence in this setting (Brazil chi^2= 6.95; p=0.03). A similar test for interaction between male control and independent ownership of assets was likewise significant in Brazil (chi^2=21.03, p=0.003).

Relationship factors. Not surprisingly, low to medium partner communication and frequent arguing and conflict are highly associated with systematic partner violence. As in the women's model, arguing appears to mediate some of the partner-related factors associated with systematic abuse. When frequent quarrelling is added to the model the odds ratios of men's controlling behaviors, frequent drunkenness, and having many children decline significantly. This suggests that conflicts over these behaviors may be a means through which control, drinking and children influence the odds of partner violence. In Peru, it similarly appears that increased marital arguing over men's extramarital affairs may be a means through which men's infidelity affects the risk of partner violence. Hence, the effect size of the association with outside partner diminishes when quarrelling is added to the model.

6.3.5 Comparing risk factors for systematic partner violence versus IPV-WHO

One of the goals of this chapter is to compare systematic partner violence and IPV-WHO in terms of their relevant risk factors. To do so, however, requires both an assessment of the impact if any of the WHO reference category on the effect size of relevant covariates as well as a comparison between the two different IPV outcome measures. Recall that the IPV measure in the WHO study compares cases against a reference category that includes emotional abuse, whereas my analysis compares systematic abuse against those who have experienced no partner violence (including emotional abuse in this definition). In the WHO study, cases identified as systematic violence by LCA would have been combined together with other more moderate forms of physical and/or sexual violence to form the WHO outcome variable IPV-WHO.

Table 6.14 compares the odds ratios and confidence intervals associated with partner related factors for various categories of partner violence. Column 1 is IPV according to the WHO definition and reference group. Column 2 is IPV-WHO with a more restricted reference group that excludes women who have experienced emotional abuse. Column 3 includes all forms of physical and/or sexual partner violence excluding cases of systematic abuse (but otherwise using the traditional WHO reference category). Column 4 is systematic partner violence as defined by LCA with a stringent reference group that excludes emotional abuse, as used in this chapter.

Table 6.14 Partner-related factors according to different definitions of partner violence, full Brazil and Peru Sample

	(1) IPV-WHO *original reference group with emotional*		(2) IPV-WHO *new reference group no emotional*		(3) Other IPV *without systematic WHO reference*		(4) Systematic partner violence (LCA-defined)	
Partner's Age	1.1*	[1.0,1.2]	1.1*	[1.0,1.2]	1.0	[0.9,1.1]	1.3***	[1.1, 1.4]
Partner's mother beaten	1.9***	[1.6,2.3]	2.1***	[1.7,2.6]	1.7***	[1.4,2.1]	2.5***	[1.8, 3.4]
Partner beaten as a child	1.5***	[1.3,1.8]	1.8***	[1.5,2.2]	1.4***	[1.2,1.7]	2.1***	[1.5, 2.9]
Frequency of drunkenness								
once a month or less	1.6***	[1.3,1.8]	1.6***	[1.4,2.0]	1.6***	[1.4,2.0]	1.4*	[1.1, 1.9]
weekly to daily	3.2***	[2.5,4.0]	4.4***	[3.2,5.9]	2.6***	[2.0,3.5]	6.7***	[4.4,10.1]
Partner uses/used illegal	1.2**	[1.1,1.4]	1.3***	[1.1,1.6]	1.2*	[1.0,1.4]	1.3*	[1.0, 1.6]
Level of partner control								
1 to 2 controlling behaviours	1.4***	[1.2,1.7]	1.5***	[1.2,1.8]	1.2*	[1.0,1.5]	2.1***	[1.5,2.8]
3 to 6 controlling behaviors	4.6***	[3.8,5.5]	6.5***	[5.2,8.0]	3.1***	[2.5,3.8]	17.7***	[13, 23.8]
Partner fights with other men	2.2***	[1.7,2.7]	3.2***	[2.4,4.2]	2.0***	[1.5,2.5]	3.7***	[2.5, 5.4]
Has outside sexual partners	2.7***	[2.2,3.3]	3.3***	[2.6,4.1]	2.4***	[1.9,3.0]	4.2***	[3.1, 5.7]
site==Pernmbuco	1.3	[1.0,1.6]	1.3*	[1.0,1.7]	1.2	[0.9,1.6]	1.2	[0.7, 1.8]
site==Lima	1.8***	[1.4,2.3]	1.8***	[1.4,2.3]	1.9***	[1.4,2.5]	1.7*	[1.1, 2.6]
site==Cuzco	2.7***	[2.1,3.5]	2.7***	[2.0,3.6]	3.2***	[2.4,4.3]	1.7*	[1.0, 2.8]
Observations	4470		3801		3612		2461	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

What is immediately apparent is that use of the original WHO reference category (which includes emotional abuse) tends to under estimate the effect of different partner-related factors on the odds that a woman will experience physical and/or sexual abuse by an intimate partner (see Table 6.14, column 1 compared with column 2). At times, this underestimation can be substantial. In the case of controlling behaviors, for example, the odds of experiencing partner violence increases from 4.6 to 6.5 among women whose partner exhibits three to six controlling behaviors. In no instance are the odds higher when exposures are compared with the original WHO reference group.

As expected, this table also confirms that the integration of systematic abuse along with lesser forms of abuse into the IPV-WHO measure generally drives up the odds ratios for the measure overall. If one removes cases of systematic violence from IPV-WHO, the effect sizes become those depicted in column 3, which are consistently the lowest in the table.

Comparing risk factors of systematic and IPV-WHO. With this foundation, we can now compare the risk and protective factors overall for systematic abuse versus IPV-WHO. Table 6.15, presents the full model for both Brazil and Peru by type of violence. In neither setting did site remain associated with risk of partner violence after adjustment for other covariates.

With some modest exceptions, the risk factors appear largely the same for IPV-WHO and systematic violence in both countries, although the effect size is generally larger for systematic abuse. In Brazil, exceptions emerge around childhood sexual abuse and women's problematic drinking. In the full model, CSA increases the odds of IPV-WHO by 70%, but has no significant effect on systematic abuse. Given that my pathway diagram argues that CSA works through some of the later variables (such as early sexual initiation and women's drinking), and that there is confounding between CSA and having a mother who was beaten, comparing CSA among women who suffer systematic abuse versus IPV-WHO, requires that we look earlier in the causal pathway. Tables 6-5 and 6-6 confirm that child sexual abuse is a risk factor for both IPV-WHO and systematic abuse, when controlled only for childhood factors. The effect size is larger for systematic violence in both countries. As predicted by the pathway diagram, the odds ratio declines with the addition of sexual debut before age 15, forced first sex, and mother being beaten.

Likewise, if one examines the risk factors related to women's drinking without entering the early childhood factors (which could dilute their effect size), the adjusted odds ratios are significant for both countries and both definitions of violence [not shown].

By contrast, contributing more than one's partner to household income or owning assets independently, appears to elevate a woman's risk of systematic abuse but not her risk of IPV-WHO. This pattern, however only holds true for Brazil. Here, women's economic empowerment appears to interact with male control of female behavior.

Table 6.15 Comparison of combined model by country & type of partner violence

	Brazil IPV-WHO	*Peru* IPV-WHO	*Brazil* Systematic	*Peru* Systematic
CHILDHOOD FACTORS				
Respondent's age	1.1	1.0	1.3***	1.2*
Sexually abused <15 years	1.7*	1.7**	0.8	4.6***
First sex < 15	1.9***	1.0	2.9***	0.6
First sex forced	1.6	2.4***	2.2	2.8**
Her mother beaten	1.9***	1.3**	2.8***	1.3
His mother beaten	1.5**	1.7***	2.3**	2.2**
Partner beaten by family member	1.5***	1.4**	1.9***	1.7***
CURRENT SITUATION				
Women's educational level				
9 to 11 years	1.0	1.0	1.0	0.9
12 or more years	0.9	0.7	0.7	0.5*
Partnership status				
Living together, not married	1.6***	1.5**	3.0***	3.7***
Regular partner, living apart	0.8	1.5	2.9	2.4
Separated, divorced, widowed	1.6	1.0	3.2**	0.6
Household SES				
Medium	0.9	1.1	1.0	1.4
High	0.7	0.8	0.6	1.3
Number of living children				
2 to 3	1.5**	1.5***	2.0*	2.1*
4 or more	2.2***	2.1***	2.1*	3.1*
Problems from drinking in past year	2.6***	1.2	1.7	1.6
Accepts 1 or more reasons for wife beating	1.2	1.3		
Assets (land, house, business)				
Owns independently	1.2	0.8	2.0**	0.7
Owns with others	0.9	0.8	0.9	0.6
Works for cash	1.1	1.0	1.2	1.5
Woman's contribution to family income				
Same as partners	1.2	1.3	1.0	1.2
More than partner	0.9	1.5	2.4*	1.2
Can count on family members for support	1.0	0.8	0.8	1.1
Partner unemployed	1.0	0.8	0.5	0.7
Level of partner control				
1 to 2 controlling behaviors	1.4*	1.2	2.2***	1.4
3 to 6 controlling behaviors	3.0***	3.2***	11.5***	11.5***
Frequency of partner drunkenness				
Less than once a month	1.2	1.7***	1.4	1.4
Weekly or daily	1.9***	3.2***	2.1*	11.2***
Partner uses/used illegal drugs	1.4	1.2	2.6*	1.3
Partner fights with other men	2.2***	1.8***	4.4***	3.3**
Partner has outside sex partners	1.7***	2.7***	1.7*	6.2***
RELATIONSHIP FACTORS				
Couple communication				
Medium	1.6***	1.3	1.4	2.4***
Low	1.5*	1.0	2.8***	2.1
Frequency of Quarrels				
Sometimes	1.4*	1.9***	1.5	2.6***
Often	3.4***	2.9***	10.0***	15.5***
site==Pernambuco (less urban)	0.9		1.1	
site==Cuzco (less urban)				1.1
Observations	2055	2441	1301	1176

6.4 Discussion

This chapter explored the risk and protective factors for partner violence associated with four different rungs of the ecological model: 1) risk factors emerging in childhood; 2) risk factors related to the respondent's current situation; 3) risk factors related to her partner; and 4) features of their current relationship. It examined each domain separately and then developed an explanatory model that combined all four dimensions.

My goal here was both to generate information specifically about Brazil and Peru and to use these countries as case examples to explore a variety of methodological and conceptual questions relevant to understanding and studying partner violence in low and middle-income countries. Before turning to these methodological questions, however, I compare the chapter's findings in each domain to the existing literature.

6.4.1 Early childhood factors

In terms of risk factors for partner violence, this study confirms the associations found in previous studies between early childhood experiences and risks of experiencing or perpetrating partner violence. In the childhood-only model, early exposure to violence by either the respondent or her partner[21] increases a woman's odds of experiencing both systematic violence and IPV-WHO. This holds in all sites. All adjusted odds achieve statistical significance except for the impact of child sexual abuse on systematic violence in Pernambuco, Brazil (see tables 6.5 and 6.6). Again, with the exception of sexual abuse in Pernambuco, all of these positive associations are maintained in the full models for systematic abuse.

Various US, Canadian, and South African studies have documented that women reporting sexual abuse in childhood are at elevated risk of experiencing partner violence in adulthood (Coid, Petruckevitch et al. 2001; DiLilo, Giuffre et al. 2001; Whitfield, Anda et al. 2003; Dunkle, Jewkes et al. 2004; Daigneault, Heberg et al. 2009). One study of 1,395 women attending antenatal clinics in Soweto, South Africa, found using Cox hazard models that sexual abuse before age 15 was significantly associated with increased risk of physical or sexual partner violence (risk ratio=2.43; 95% CI: 1.93, 3.06) in adulthood and with sexual violence by non-intimates, although this association did not reach statistical significance (2.33; 95% CI: 0.92, 4.98)(Dunkle, Jewkes et al. 2004). This chapter's findings extends the results from research using IPV-WHO to cases of systematic abuse in both Brazil and Peru.[22]

Analysis also reveals that part of the way that sexual abuse appears to affect risk of systematic partner violence is through early sexual initiation and forced first sex (as evidenced by the reduction

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[21] Including the woman being sexually abuse in childhood, her partner being physically abused, and either witnessing partner violence when they were children.

[22] By contrast, some studies among adolescents in the US, but not all (see Duke 2010), have failed to find an association between child sexual abuse and physical aggression between dating partners (Olsen et al, 2010)

in odds ratios when these factors are entered into regressions). As demonstrated in a range of other studies, the younger a woman is at her first intercourse, the more likely that force has been involved (Dunkle, Jewkes et al. 2004; World Health Organization 2005). Sexual abuse and forced sex appear to increase the likelihood that women will develop various psychological and trauma related reactions—such as dissociation, low self- esteem, and depression—that place them at increased risk of later sexual victimization (Messman-Moore and Long 2003). On average, victims of abuse appear less able to assess sexual risk and more prone to having multiple partners, engaging in transactional sex, and using alcohol or drugs (Fergusson, Horwood et al. 1997; Messman-Moore and Long 2003; Friesen, Woodward et al. 2010).

Experiences of violence in childhood similarly increase the odds that boys will go on to perpetrate partner violence in adulthood. Studies have repeatedly shown that men who witness their mothers being abused or who are beaten themselves as children are more likely to be violent with intimate partners. In the WHO study, for example, men's exposure to marital violence as a child was positively associated with partner violence in 15 out of 15 sites (10 significant), with additional corroborating evidence from studies in Haiti, India, Indonesia, Mexico, Nicaragua, Peru, Vietnam, and South Africa (Ellsberg, Peña et al. 1999; Hakimi, Nur Hayati et al. 2002; Martin, Moracco et al. 2002; Abrahams and Jewkes 2005; Contreras Urbina 2005; Flake 2005; Gage 2005; Vung and Krantz 2008; Abramsky, Watts et al. 2011). Likewise, women who report that their partners were physically abused also had increased odds of IPV-WHO in 15 out of 15 sites in the WHO study.

My results in Brazil and Peru further corroborate findings from other countries that types of violence tend to overlap in families, with girls who suffer child sexual abuse, more likely to have abused mothers and boys who grow up with domestic violence, more likely to be beaten by a family member (Hamby, Finkelhor et al. 2010). Despite this overlap, both experiencing and witnessing abuse in childhood emerge as independent risk factors for perpetrating and experiencing partner violence in Brazil and Peru. Tests for interaction among childhood variables were not significant.

Despite the strength and consistency of these associations, it is still not possible to conclude definitively that these exposures are causally linked to partner violence. There are alternative hypotheses that cannot be fully eliminated. One outstanding possibility is that it is not the experience of sexual or physical abuse per se that elevates the odds of later partner violence, but some other adversity that frequently accompanies childhood abuse. Research from high-income countries has demonstrated that types of violence tend to overlap in families, both with each other and with a chaotic home environment (Dong et al 2004; Dube et al 2004; Dube et al 2003; Knickerbocker 2007). Children who are abused or who witness violence are also more likely to have a parent who is addicted to alcohol or drugs, to experience early parental death, separation or divorce; or to have a caretaker who is depressed or mentally ill. These experiences, collectively termed "adverse childhood events" have a graded association with a range of negative health and social outcomes, including partner violence. The greater the number of adverse events, the higher the odds of experiencing negative outcomes, including partner violence (Dube, 2001; Dong et al 2003; Felitti et al 1998).

These adverse childhood events in turn are more likely to occur among families who live in areas of concentrated disadvantage, with less residential stability, lower stocks of social capital, and lower

levels of employment and education (Fang and Corso 2007; Friesen, Woodward et al. 2010). Thus, reports of childhood beatings or sex abuse could be a marker for other family or neighborhood factors that are the true casual links with later partner violence.

The current study cannot rule out this possibility because it did not collect data on the full range of abuse and family-related stressors that have been shown to be relevant in other studies. Especially missing is information on the woman's experience of physical or emotional abuse in childhood, as well as data on childhood trauma—for example, having a depressed, alcoholic or dru-addicted parent; or losing a parent to suicide, prison, or divorce. As a result, it is impossible to assess whether women's experience of sexual abuse and men's experience of beatings in Peru and Brazil constitute independent risk factors for future partner violence, or whether they are markers for other unmeasured confounders.

Studies from high-income countries that have collected data on possible confounders generally support the notion that childhood physical and sexual abuse and witnessing marital violence are causally linked to adult partner violence. For example, most, but not all studies (see Rind and Tromovitch; Harter et al 1988 for exceptions) have found that the effects of CSA persist after control for potential confounders (e.g. Finkelhor et al. 1989; Dube et al. 2005; Johnson et al 1999; Kendler et al 2000; (Roustit, Renahy et al. 2009; Chartier, Walker et al. 2010; Friesen, Woodward et al. 2010). Friesen and colleagues, for example, found that exposure to CSA remained significantly associated with partner violence, even after adjustment for early childhood and family environment factors. Several factors from adolescence appeared to partially or fully mediate the association with severe sexual abuse, notably a history of early consensual sexual intercourse, a higher number of sexual partnerships, substance abuse problems, and low self-esteem (Friesen, Woodward et al. 2010).

6.4.2 Risk factors related to the respondent

The most striking aspect of the findings related to the women-only model is the concordance between factors that predict systematic abuse at the individual level in both Brazil and Peru. In both settings, a range of respondent-related factors are associated with increased odds of experiencing systematic partner violence, including: having more than one child; living with a partner but not being married or being separated or divorced; excessive use of alcohol, and contributing more than one's husband to the household income. Factors that appear protective in both settings include completing a secondary education and being able to count on your family for support. In neither setting, however, do attitudes accepting of wife beating, beliefs consistent with male dominance, or the respondent working for cash—all significantly associated with systematic partner violence in bi-variable analysis—remain significantly associated with partner violence in multi-variable analysis (see model 3, Table 6.11 and Table 6.12). The point estimates of these variables hover close to 1, suggesting that even if statistically significant in a larger sample, their effect on women's individual risk of systematic abuse would be modest.

These findings are largely consistent with results for partner violence from other settings. However, a few exceptions are noted below.

Number of children. As reviewed in Section 2.4.1, most but not all studies have found an association between the number of children women have and their risk of partner violence (Ellsberg, Peña et al.

1999; Kishor and Johnson 2004; Olsen, Parra et al. 2010) although a study in Israel failed to find a relationship and another in Uganda found that women with six or more children were at reduced risk of partner violence (Koenig, Fauveau et al. 1988). It is impossible to know without further prospective studies what portion of the measured association may reflect many children because of partner violence or as a function of shared risk factors earlier in life. Some researchers have hypothesized that women in abusive relationships are less able to control their reproductive lives and hence more likely to have many children (Ellsberg, Peña et al. 2000). Equally plausible is that having many children creates stress and provides fodder for conflict, a hypothesis supported in part by the mediation analysis that shows that in Peru and Brazil, the odds ratio for number of children declines when marital conflict is added to the model. Having many children remains a strong and significant risk factor when partner and relationship factors are added in the final model.

Alcohol use. In the respondent only model, women's alcohol use was strongly associated with systematic partner violence in both Brazil and Peru. When women's drinking is considered in the context of the full model (with partner and relationship factors added), female alcohol problems loses its significance, even though women problem drinkers continue to have odds of partner violence 70% to 80% higher than nondrinkers (see Table 6.13). This may be a function of low numbers of female problem drinkers or could reflect that women's drinking frequently co-occurs with problem drinking by her partner and partner drinking dominates in the final model.

Women's use of alcohol has been linked to increased risk of partner violence in both low and high-income countries. In the Philippines and the United States, women's drinking has been associated with both being a victim of and perpetrating partner violence (Ansara and Hindin 2009); (Lipsky, Caetano et al. 2005). Female alcohol consumption is positively associated with experiencing severe physical violence in China (Parish, Wang et al. 2004), and with current partner violence in both rural Uganda (Koenig, Lutalo et al. 2003) and South Africa (Jewkes, Levin et al. 2002). In a recent national survey in Mexico, the odds of severe partner violence were 2.5 times (OR 2.5, 95% CI: 1.62-3.90) higher among women who drank more than once a month compared to abstainers (Avila-Burgos, Valdez-Santiago et al. 2009).

Again, the dominant direction of the relationship is unclear. Some longitudinal research suggests that childhood abuse and witnessing parental violence leads to alcohol misuse in later life (Ehrensaft, Cohen et al. 2003; Sartor, Agrawal et al. 2008; Roustit, Renahy et al. 2009) whereas other studies, like those cited above, demonstrate that women's drinking can contribute to the risk of abuse.

Economic independence. As in many other studies, economic factors play a complicated and inconsistent role in the risk of partner violence in Peru and Brazil. Working for cash does not appear to affect risk of systematic abuse, while the effect of asset ownership and contributing to the household income seems to depend on the nature of the woman's role versus that of her partner. In both Brazil and Peru, if a woman contributes more than her partner to family maintenance, she is at increased risk of severe partner violence. In Brazil if she owns assets independently of her partner, she is also at increased risk compared to women who have no assets or who own assets together with someone else.

A systematic review of studies (1992-2005) assessing the impact of employment (or access to cash) on women's risk of violence in developing countries found that those suggesting increased risk outnumbered those suggesting protection by three to one (Vyas and Watts 2008). More recent national surveys in Mexico (Avila-Burgos, Valdez-Santiago et al. 2009) and India (Dalal and Lindqvist 2010) similarly found increased risk among employed women and a prospective study of urban low-income women in Bangalore found that women who were employed at time 1 and women who became newly employed during follow up both had increased odds of violence (adjusted OR=1.6, 95% CI:1.1-2.3 at baseline; adjusted OR-1.8, 95% CI: 1.3-2.5 at subsequent visit). The lack of an association in Brazil and Peru may be because my models adjusted for many more factors than the other studies cited.

Only a handful of studies have explored the impact of women's relative contribution to family income as a risk factor for partner violence, with studies from Bangladesh (Bates, Schuler et al. 2004; Ahmed 2005) and the Philippines (Hindin and Adair 2002) suggesting increased risk when women contribute more than their husbands and a study from Ireland suggesting no relationship between relative contributions and odds of partner violence (Watson and Parsons 2005). These findings, and those from Peru and Brazil, are consistent with relative resource theory (Macmillan and Gartner 1999) and gendered resource theory (Atkinson, Greenstein et al. 2005), which both argue that men—especially those with traditional gender ideologies—who cannot live up to their "breadwinner" role, may use violence as a way to reassert their masculine identity.

Relative resource theory predicts that women will be at increased risk regardless of the gender-related attitudes of her partner if she controls more resources than him. Gendered resource theory maintains that his response will depend in part on the degree to which he embraces traditional gender roles. Atkinson and Greenstein's national study of US adults found that when husbands held traditional gender ideologies, wives' proportion of the couple income had a very strong effect on the likelihood of partner violence. When men held equalitarian views, however, wives proportion of income had little if any impact on the odds of abuse (Atkinson, Greenstein et al. 2005). The fact that in Brazil both contribution to family income and independent ownership of assets interacted with male control of female behavior (here used as a surrogate measure for traditional gender ideology), lends further support to the gendered resource theory.

Similar logic could be applied to the finding that in Brazil women who own assets independently are at increased risk of partner violence. Here too, male control of female behavior moderates this association, as would be predicted by gendered resource theory.

Secondary education and social support. In the women-only models, completing 12 or more years of education is highly protective in both Brazil and Peru (aOR 0.5 in both Brazil and Peru) as is being able to count on your family for moral support. Family support becomes insignificant in both countries in the combined models. By contrast, completing secondary education remains protective in the full models (aOR 0.7 in Brazil and 0.5 in Peru) but it achieves statistical significance only in Peru. Loss of significance in this case, probably represents the high number of covariates included in the final model (23) compared to the small number of cases available for analysis.

To make an impact on the risk of systematic partner violence, girls need to complete their secondary education in Brazil and Peru. Primary school alone appears to confer few benefits. This finding is

consistent with the wider literature and with the results of the WHO study. To reap the benefits of reduced partner violence, policy goals must emphasize keeping girls in school through 12th grade (Vyas and Watts 2008; Abramsky, Watts et al. 2011).

6.4.3 Partner-related factors

In both Brazil and Peru, partner-related factors had the most consistent relationship with systematic abuse in the final models, with male control of female behavior as the strongest risk factor in every setting. Other male behaviors associated with "traditional" masculinity—such as fighting with other men, excessive alcohol consumption, and having outside sexual partners—are also highly correlated with perpetration of systematic abuse in both Brazil and Peru. These findings parallel results from findings in India and South Africa that certain male behaviors tend to cluster—that is, men who sexually coerce or beat their partners are also more likely to drink excessively, have outside sex partners, fight with other men, seek sex from prostitutes, and engage in risky sexual behaviors (Martin, Kilgallen et al. 1999; Abrahams, Jewkes et al. 2004; Santana, Raj et al. 2006; Decker, Seage et al. 2009; Decker, Seage et al. 2009; Townsend, Jewkes et al. 2010). Not surprisingly, these same men are also more likely to acquire an STI or HIV, and to bring that infection home to their wives.

Interestingly, the only partner-related factor that was *not* associated in Brazil and Peru with systematic abuse was male unemployment, although our measure of employment status was crude and did not capture past unemployment or employment instability. Findings on male unemployment and partner violence from other studies are mixed. Unemployment among men strongly predicted the recurrence of intimate partner violence in nationally representative study of couples followed prospectively in the United States. Likewise, in the first prospective study of this topic in a developing country, women in Bangalore, India whose husbands had difficulty finding or keeping a job at one visit were more than twice as likely (adjusted OR-2.3, 95% CI: 1.6-3.3) to experience partner violence by their next interview (Krishnan, Rocca et al. 2010) than women whose partners had stable employment. By contrast, male unemployment was not associated with perpetration or experience of partner violence in three separate surveys in South Africa (Jewkes, Levin et al. 2002; Abrahams, Jewkes et al. 2004; Gupta, Silverman et al. 2008) or in Serbia (Djikanovic, Jansen et al. 2009).

Researchers have advanced different theories to explain how unemployment might work to increase the likelihood of partner violence. Farrington and Cano and Vivian, for example, have emphasized the material and psychic stresses that lack of resources and work insecurity place on families and relationships (Farrington 1986; Cano and Vivian 2001). Others emphasize the symbolic value of employment and the powerlessness that men experience when they become unable to provide for their family. In such situations, men may compensate by exerting even greater control in the one domain where they still feel powerful—the home (Jewkes, Levin et al. 2002). Further study is needed to better understand the role of employment instability or male unemployment on women's risk of partner violence.

6.4.4 Relationship-level factors

Of the three relationship-level factors (relationship duration, couple communication, and arguments), only duration emerged as not significantly associated with risk of lifetime partner

violence among women. By contrast, frequent quarreling appears to be highly and significantly associated with systematic abuse and IPV-WHO in both Brazil and Peru, with the effect size being much larger for systematic compared to IPV-WHO in both countries (See Table 6.15). This is consistent with a systematic review of the literature that found a significant correlation between marital conflict and partner violence in 10 of 11 studies in multi-variable analysis (Vives-Cases and Gil-Gonzalea 2009).

Indeed, quarreling appears to be one pathway through which having many children, men's drunkenness, extramarital affairs and controlling behavior affect risk of partner violence, as evidenced by the change in effect size when quarrelling is added to the final model. Of course, it is important to not "overread" the implications suggested by this mediation. There is likely confounding between poor couple communication and frequency of quarrelling and there may be conceptual overlap between quarrelling and the outcome measure of systematic abuse. Likewise, both measures are crudely rendered and are likely to capture a host of complicated dynamics. Nevertheless, the apparent impact of these simple relationship variables upon other variables in the models suggests that more finely honed versions should be incorporated into future studies.

6.4.5 Implications for ecological model

The above findings taken collectively suggest some nuanced refinements for the ecological model that can and should be evaluated with data from other settings. In terms of women's factors, the impact of sexual abuse in childhood on partner violence in adulthood appears partially mediated through early first sex, including forced first sex. This in turn increases the number of children women are likely to have, which appears to partially account for the association found between many children and risk of partner violence. Nonetheless, the association between CSA and partner violence, could prove to be the result of some unmeasured third factor related to growing up in a dysfunctional environment. Without further data on other adverse childhood events it is impossible to calculate accurately the effect size of sexual abuse on risk of partner violence

Findings from this chapter also lend credence to gendered resource theory, suggesting that women who independently own assets or contribute more than their husband to household maintenance are at increased risk of abuse, even more so in households where men hold traditional gender attitudes.

The chapter's strongest take home message is that factors associated with a woman's partner rather than herself, appear to drive risk of violence most strongly, including controlling behaviour, binge drinking, having outside sexual partners and fighting with other men. Without additional data on life-course, genetic, and psychological variables (such as anti-social behaviour, sensation seeking, empathy, and impulse control), it is impossible to determine the degree to which these behaviors evolve from culturally enforced norms around masculinity, certain underlying psychological tendencies, or both.

A just-published study by Jewkes and colleagues (2012) is the first to probe the possible relationship between past anti-social behaviour, various dimensions of psychopathy, empathy, engagement in crime and physical and sexual abuse of intimate partners, among South African men. The specific focus of this study was on the behaviour and psychological makeup of men who frequented prostitutes or who exacted sex from women in exchange for food, gifts or other items. The prostitution study concluded:

> "...Most men who have had sex with women in prostitution are not 'normal' men. They are all more likely to have engaged in a range of illegal practices. Further the largest group of these men, those who had had sex or relationships predicated on their occupying a provider role, displayed a self-cocused instrumental masculinity. They had the most pronounced gender inequitable attitudes and psychological attributes indicating ruthlessness in interpersonal relations. They were also much more likely to have engaged in a range of acts of gender-based violence."

The chapter's final insight involves the degree to which some factors appear to increase victimization by providing ready fodder for arguments. This is the case, at least in part, for having many children, male binge drinking, and men having outside sexual partners. Future work on the ecological model must focus on further elucidating possible pathways through which different factors work to exert influence on risk of violence.

6.4.6 Risk factors for systematic versus IPV-WHO

Overall, my findings suggest that the risk factors for lifetime experience of systematic partner violence in Brazil and Peru are similar to those for IPV-WHO. As described below, the exposures that predict severe repetitive violence in these settings appear similar to those predicting lifetime exposure to physical or sexual partner violence in other low and middle-income countries. This suggests that in the absence of latent class analysis or an alternative methodology to identify extreme cases, IPV-WHO can serve as a surrogate to identify risk factors predicting more serious forms of abuse. This is promising because it suggests that the burgeoning literature on risk factors related to IPV-WHO can productively be applied to prevention programs as well as to theories related to battering and other forms of serious partner violence. While these findings suggest that IPV-WHO can be used to identify risk factors for systematic violence, it cannot be used to generate accurate estimates of the effect size associated with these factors.

Nonetheless some important improvements could be made even in the absence of LCA. Most notably, a true no-violence reference group could be used by removing ever-partnered women who have experienced emotional abuse from the denominator of IPV-WHO. Researchers interested in systematic abuse who rely on DHS or WHO data should also consider reporting findings for severe IPV-WHO, in addition to using the traditional IPV-WHO measure (which combined more and less serious cases).

Differences of kind or degree?

My general conclusion—that the risk factors for systematic abuse and IPV-WHO appear largely the same albeit with different effect sizes—differs from the conclusions drawn by two other sets of researchers who have used national household surveys to compare risk factors for LCA-derived categories of abuse: one conducted in Ireland and another in Canada (Macmillan and Gartner 1999; Watson and Parsons 2005). Both sets of investigators argue that the categories of violence they identified through LCA have sufficiently different risk factors to imply different underlying types of violence. As the authors of the Irish study observe:

> It is not the case, then, that vulnerability to minor incidents and to severe abuse are associated with the same characteristics. Rather, they are linked in different ways to

> characteristics of the respondent and the partner. This finding lends support to the argument that two different phenomena are being captured by the behavioral items used to measure domestic abuse. It is an important caution against an uncritical 'acts-based' approach that ignores the pattern of behavior and the impact on the person experiencing it. To measure domestic abuse solely on the basis of whether the person ever experienced a certain behavior from the partner would be to make the mistake of conflating two very different phenomena (Watson and Parsons 2005).

Likewise, the authors of the Canadian study conclude:

> The existence of different varieties of violence may account for inconsistent findings in previous research on correlates of spouse abuse. In support of this argument, our analyses indicate distinctive correlates and perhaps distinctive etiologies for the different types of violence (Macmillan and Gartner 1999).

Interestingly, in both the Canadian and Irish studies, the direction, magnitude, and significance of associations for the various LCA-defined abuse categories actually differ for only a few factors. For example in the Irish study, vulnerability to severe abuse is higher among those with children and those in poor health or with a disability, but these factors have no impact on vulnerability to minor incidents (Watson and Parsons 2005). As in my analysis, the major differences are in the strength of the associations, suggesting that despite the authors' stated conclusions, their findings may not be so different than mine.

If the Ireland and US studies do indeed identify distinctions in kind rather than degree, there are a number possible explanations for why our conclusions may diverge. First, it may be that there really are distinctions in types of violence in high-income settings that are stronger or more discernible than those found in low and middle-income settings where the overall prevalence of partner violence is higher. Alternatively, the difference may reflect variations in basic comparisons being analyzed in the studies. In both the Canadian and Irish study, the authors compare severe/systematic abuse, with one or more categories of moderate/minor violence identified through LCA. By contrast, this chapter examines risk factors for systematic violence compared to IPV-WHO (which includes both cases of systematic abuse and minor acts of violence). If I were to compare the risk factors for systematic abuse with those from a less severe category (e.g. physical violence), I too might find different associations. In my present analysis, risk factors for systematic abuse appear to drive the associations found for IPV-WHO.

6.4.7 Strengths and limitations

This analysis introduced a number of important innovations to the study of partner violence in low and middle-income countries. It is the first study in Latin America to use Latent Class Analysis to create an outcome variable that combines physical, sexual, and emotional abuse rather than artificially separating out each type of violence. This approach better approximates how women experience abuse in their lives. It is also the first to compare risk and protective factors for systematic abuse with those that predict any experience of physical or sexual partner violence (IPV-WHO). By doing so, it suggests the extent to which the existing literature on partner violence (based on the traditional WHO IPV measure) can productively be applied to understanding risk factors for more severe types of abuse, and what biases policy-makers should be aware of if doing so.

A further strength of the chapter is its reliance on pathway diagrams, derived from evidence, to inform the selection of variables for each phase of model building. By exploring childhood, partner, respondent, and relationship factors in a stepwise fashion, I was able to test specific theories about how key variables work to moderate or mediate relationships. In addition, this analysis went beyond examination of just childhood, women or partner characteristics that affect abuse, to explore the combined impact of these factors across the life course. Most other studies that have used the ecological model have not been explicit about their assumed explanatory pathways and have explored risk only from the perspective of partner, woman, or childhood factors, independently.

At the same time, both my analysis and the WHO study itself have a number of important limitations. Because I had not developed the pathway diagrams when we designed the WHO questionnaire, I am missing information on several key potential confounders and mediators, including more information on the woman's family of origin, other adverse experiences she may have experienced in childhood that could affect her development, and whether she was physically or sexually assaulted by someone other than a partner *prior to* or *after* the abuse started in her intimate relationship. Similar information is missing for the woman's partner, most notably measures to tap underlying antisocial behavior.

To address these limitations, future research on partner violence should collect information on a full range of family- of-origin factors, including multiple forms of childhood maltreatment, patterns of parental discipline, socioeconomic hardship and other childhood adversities that could affect a child's development. One option would be to incorporate a version of the Adverse Childhood Experiences (ACE) questionnaire or the Childhood Trauma Questionnaire adapted for developing country settings into future studies of partner violence in low and middle-income settings. It should also collect information on other forms of violent or antisocial behavior by men.

In addition, as noted in the methods section, the wording and placement of the question on first intercourse was confusing and undoubtedly led to some overlap between the measure of forced first sex and child sexual abuse. The fact that I dropped 128 cases where it could not be established whether a woman's most recent partner was her violent partner is also a source of potential bias. These cases account for only 2.6% of cases and reinserting them into the analysis, does not substantively change the study results.

The study also suffers from the same limitations that are shared by all cross-sectional surveys that rely on retrospective self-reports of behavior. Without being able to follow women over time, it is impossible to sort out issues of temporality or to draw conclusions around causality. The study also requires women to answer questions about sensitive events that took place in the past, leading to potential recall bias. Methodological studies in the United States have suggested the women tend to telescope recall of violent events, bringing them forward in time (Schwartz 2000).

There is, however, almost no evidence in the international literature that women over-report experiences of partner violence, although women do appear to systematically underreport sexual violence and child sexual abuse because these types of victimization are strongly stigmatized in many settings (Haugaard and Emery 1989; Smith 1994; Hegarty and Roberts 1998). The fact that all of our data on male partners is provided by women is likewise a limitation. The WHO investigators

chose to rely exclusively on women's reports rather than interview couples in order to maximize women's safety.

In sum, this study suggests some important avenues for further research to improve our understanding of the nature and etiology of partner violence in low-income settings.

Chapter 7: Understanding the Geographic Distribution of Partner Violence

Guiding question

- Which community level factors are most strongly associated with the geographic distribution of partner violence between settings?

7.1 Background

This chapter takes off from the now familiar observation that rates of partner violence vary greatly among different geographic settings. The unequal distribution of violence raises the interesting proposition that contextual factors or community-level processes may help explain differences in rates of abuse, thereby offering opportunities for policy or programmatic intervention. Shifting the analytic gaze "upstream" from the individual to the community, focuses attention on potential normative and structural factors that may contribute to partner violence by shaping the environment in which couples live, work, and raise children.

Although strong anthropological and qualitative evidence exists indicating that cultural and context variables are important in determining levels of IPV across settings, until recently there has been relatively little quantitative data to support these observations. In his ecological analysis of 90 ethnographic accounts in the Human Relations Area Files, for example, Levinson found that wife beating occurs more often in societies in which men have economic power, husbands hold ultimate decision making power in the family, women have restricted access to divorce, and adults often resolve conflicts by fighting with one another (Levinson 1989). Likewise, Counts and colleagues found in their series of anthropological case studies that partner violence is less common in cultural settings where there are informal or formal sanctions against wife beating and where social structures permit women to find "sanctuary" from violence by returning to their natal family, staying with friends or neighbors, or leaving the relationship permanently (Counts, Brown et al. 1992).

These findings have generally emerged from ethnographic studies in small-scale traditional societies. While they may or may not be relevant to today's market economies, they do suggest that ecological studies might yield insights into "higher level" processes that contribute to the risk of partner violence. In the 1980s, ecological studies generally lost favor among epidemiologists because of concerns over the "ecological fallacy", the faulty logic that assumes that factors that predict risk at a population level will also predict increased risk among indivdiuals (Schwartz 1994). On the other hand, Schwartz and Carpenter have reminded us that the resulting preoccupation with individual-level risk factors can lead to equally faulty conclusions. As they point out in their now classic article, "The right answer for the wrong question":

> When the question of interest is about risk differences between groups or time periods, the answer requires examination of multiple groups or multiple time periods; otherwise a type III error can result. The assumption underlying the concept of the type III error. . .is that risk differences between individuals within a particular population may not have the same causes as the difference in the average risk between two populations (Schwartz and Carpenter 1999)."

In short, if we want to understand factors that shape the geographic distribution of partner violence we must explore factors that operate at a population level.

One way to do so is to apply multilevel models that allow investigators to simultaneously explore the impact of individual and community-level factors (Diez-Roux 1998; Diez Roux 2008). Multilevel models also allow one to establish whether factors predictive of population-level risk reflect community-level processes or are a function of the aggregate characteristics of the individuals who live in that community (Diez Roux 2002)]. Yet pure ecological studies also have important insights to offer. By focusing attention upstream of the individual, they highlight areas for potential intervention that could have greater impact on the prevalence of a phenomenon than addressing individuals, one person at a time.

Limited work has been done to identify community-level predictors of partner violence. Rather than test a specific hypothesis, this chapter therefore examines a range of factors that, in theory, might affect neighborhood rates of partner violence. In taking this wide-angle view, I am nonetheless particularly interested in how dominant notions of masculinity, enacted through stereotypical male behaviors, might encourage and perpetuate violence by male partners.

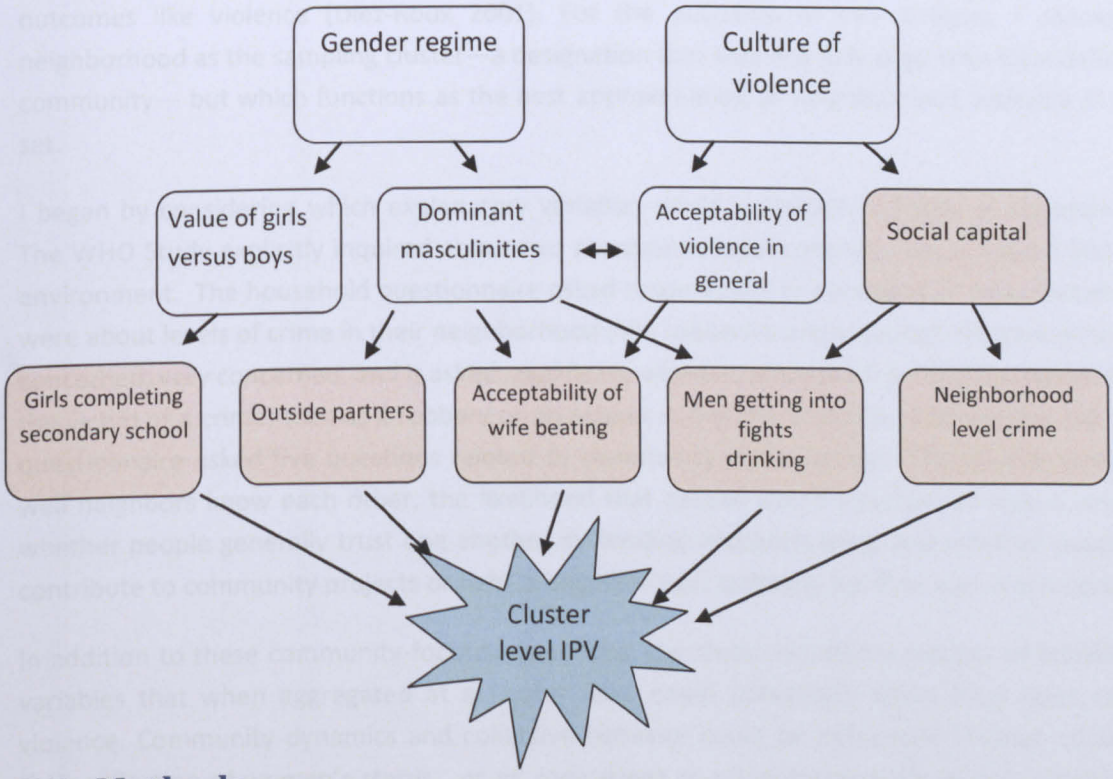
The notion that certain constructions of male behavior may be linked to risk of partner violence is a commonly put forward in the literature (Anderson and Umberson 2001; Jewkes 2002; Moore and Stuart 2005; Levitt, Swanger et al. 2008). According to constructivist and feminist theory, gender is constructed through everyday behaviors and practices that help to sustain and reproduce broader structures of power and inequality, most notably patriarchy (Courtenay 2000). Theorists recognize both "dominant" masculinities and "resistant" or "subordinated" masculinities that go against the prevailing hegemonic ideal. In this context, "hegemonic" masculinity refers to those practices, behaviors, and norms that legitimate men's dominance over women and therefore reinforce gender hierarchies (Connell and Messerschmidt 2005). While particular men may or may not conform to the ideal, they constantly negotiate and build their own masculine identities in reference to it (Howson 2006).

Hegemonic masculinities tend to portray men as breadwinners, as having authority over women, as dominant in the family, as heterosexual and hypersexual, and as tough and aggressive. There is the competing notion of men as father and protector, but this is often intertwined with paternalistic control, especially of women and girlfriends (Buller-Soto 2010). Research from Peru and Brazil suggest that men and boys in both countries are still highly influenced by the traditional hegemonic script (Fuller 2001; Couto, SSchraiber et al. 2007; Buller-Soto 2010). While individual gender roles may be shifting due to economic change and emancipatory demands from women, the prevailing gender regime still portrays women as subordinate to men and expects men to be the primary wage

earner and the authority in the family (Couto, Schraiber et al. 2007). Men outside of the family are expected to be tough, aggressive when necessary, and always keen on sex (Fuller 2001).

Keeping these ideas in mind, I propose the following conceptual framework linking cluster level rates of partner violence to cluster-level norms and male behaviors related to the dominant gender regime and cultural norms around using violence as a means to resolve conflict. As detailed in the methods section, the variables shaded in peach represent those that can be operationalized from the WHO data set as on the causal pathway between higher order notions of dominant masculinities and the gender regime and a culture accepting of violence.

Figure 7.1 Conceptual framework of the relationship between higher order constructs, cluster-level variables, and the population level of partner violence



7.2 Methods

This study explores explanatory variables that predict the patterning of partner violence at the community level in Brazil and Peru using household interview data collected as part of the WHO Multi-country study of Domestic Violence and Women's Health. Details of the survey design and implementation are presented in Chapter 4, section 4.1.

7.2.1 Sampling and data collection

In Brazil, the study used multi-stage sampling by clusters to interview a representative sample of women, aged 15-49, living in the city of Sao Paulo, (Garcia-Moreno, Jansen et al. 2006; Schraiber,

d'Oliveira et al. 2007) and the largely rural state of Zona da Mata Pernambucana. The number of clusters surveyed totaled 72 in Sao Paulo and 118 in Pernambuco.[23]

In Peru, 166 clusters were selected, with probability proportional to size, from a list ordered according to socioeconomic status. In the Department of Cuzco, 43 clusters were selected from Cuzco city and an additional 66 from the rest of the Department, all self weighted with probability proportional to size.

7.2.2 Analytic approach and selection of variables

This analysis required identifying and conceptualizing processes and variables at a neighborhood level that could potentially affect the prevalence of partner violence. In ecological studies, neighborhood or community is used to refer to a person's immediate residential environment, which is hypothesized to have both material and social characteristics that relate to health and other social outcomes like violence (Diez-Roux 2001). For the purposes of this analysis, I conceptualized neighborhood as the sampling cluster—a designation that may not fully align with local definitions of community— but which functions as the best approximation of neighborhood available in this data set.

I began by considering which explanatory variables could potentially operate at community level. The WHO Study explicitly inquired about two community-level concepts: social capital and criminal environment. The household questionnaire asked respondents to comment on how concerned they were about levels of crime in their neighborhood (like robberies and assaults): Not concerned, a little concerned, very concerned, and it asked specifically whether someone from the household had been the victim of a crime, such as a robbery or an assault in the last 4 weeks. Additionally, the woman's questionnaire asked five questions related to community social capital. The queries covered how well neighbors know each other, the likelihood that people would interfere to stop a street fight, whether people generally trust one another in lending and borrowing, and whether people would contribute to community projects or help a neighbor who suddenly fell ill or was in an accident.

In addition to these community-focused questions, the study included a number of individual-level variables that when aggregated at a cluster level could potentially affect local rates of partner violence. Community dynamics and collective behavior could be influenced through social norms, their reflection of women's status, or as indications of social forces such as male unemployment and concentrated economic disadvantage.

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[23] The selection of sampling units was carried out in three stages using probability proportional to size. In the first stage, 72 census tracts were randomly selected from the probability matrix of 263 census tracts which were ranked by census blocks and level of education attained by the household heads. These 263 tracts were previously randomly selected from the 10,096 census tracts drawn by IBGE for the national census. In the second stage, 30 households were selected in each census tract. Finally, in each household with female residents aged 15 to 49, one woman was randomly selected to be interviewed. The sample was weighted to account for the differential likelihood of women being selected in large versus small households.

I also considered, though eventually rejected, the notion of including various life course variables that could indicate the level of community tolerance of other forms of violence, such as child sexual abuse and harsh physical punishment of children. The only variables available in the WHO data set to address these issues are women's recollections of their own experience of sexual abuse or forced sexual initiation in childhood and their reports of whether their partners' were beaten as children.

Theoretically, the prevalence of such reports when aggregated at a community level could signal the level of community tolerance for such behaviors or the presence of social dynamics that encourage abuse of children; but it is not possible to eliminate data about partners who may have grown up in other communities. While the WHO questionnaire does identify women who have lived in the same community all their lives, it does not ask where women's partners' were born, therefore it is impossible to know whether men's reported experience in childhood relates to the cluster in which the woman currently resides. Conceptually, I only want to aggregate factors that could relate to the average rate of partner violence in that respondent's cluster.

7.2.3 Constructing appropriate aggregated variables

The issue of identifying the appropriate subset of data to aggregate for an ecological study of partner violence is conceptually challenging. First, both the outcome and explanatory variables must represent the same community and the number of responses per cluster must be sufficiently large to allow for an accurate and stable assessment of cluster-level means. Let us look at both outcome and explanatory variables in turn.

Defining the outcome variable. For the purposes of this study, I defined my outcome variable as a woman's experience of partner violence during the time that she lived in the community where she was interviewed. This definition ensures that respondent-related factors aggregated to the cluster level will relate specifically to the community in which the violence took place. Another approach to ensuring such concordance is to restrict analysis to acts of partner violence experienced in the last 12 months and eliminating women who moved into the cluster within the last year. While conceptually feasible, this approach yields a much smaller number of cases upon which to base the analysis. While I would have liked to concentrate on the more extreme, "systematic" forms of abuse identified though latent class analysis, I chose to use the IPV-WHO measure of partner violence in order to maximize the number of cases for the analysis. As demonstrated in Chapter 6, risk factors at an individual level were similar in Brazil and Peru for both systematic and IPV-WHO.

Constructing exposure variables. For exposure variables, I derived cluster level variables by aggregating data collected from individual women residing in each cluster, expressed as either a proportion or a cluster-level mean. Special effort was made to ensure that the denominators for each variable (e.g. all women, ever-partnered women, etc.) were correctly selected. For some variables (e.g. proportion of women who completed secondary school), this meant aggregating data from all women interviewed, aged 15 to 49. For questions asked only of ever-partnered women (have you been formally married?), this meant aggregating answers and dividing by the number of ever-partnered women.

For factors related to male behavior or norms, however, the challenge was more difficult. The only data available from the WHO survey on male factors is derived from the responses of ever-partnered

women reporting on their current or most recent partner. This means that there are no data collected directly from men or reflecting the experience or behavior of single (i.e. never-partnered) men. Similarly, we have no data reflecting the experience or behavior of once-partnered men whose last partner now has a new partner or whose last partner has had more than one relationship since their breakup (since we have data only on women's current or most recent partner).

To express cluster level dynamics, we would thus have to assume that all current or most recent male partners live in the same cluster as their female partner does (which may or may not be true). For example, in Sao Paulo, 18.4% of ever-partnered women are not currently living with a man and fully 35.4% of women whose current or most recent partner was violent, are not cohabitating with him. This raises the very real prospect that some of the partner level data refer to men who do not live in the cluster/community of interest. To avoid this source of potential misclassification, I included partner data *only from women who reported living with their current partner.* This solution admittedly under represents the views and behaviors of single and never partnered men, but it avoids drawing insights on community level dynamics from men who live outside of the cluster.

Table 7.1 describes and presents the aggregate values of key outcome and exposure variables, expressed as the mean or proportion of cohabitating couples, as averaged across all clusters. Variables that are not immediately self-evident are defined in footnotes to the table.

Control variables. I also constructed a handful of control variables to adjust for potential confounding. Because young men are known to be more violent than older men, I included the proportion of cohabiting men in the cluster under the age of 25, thereby adjusting for any bias introduced through a disproportionate number of younger men (Krug, Dahlberg et al. 2002). Likewise, since formal marriage seems to be universally protective at an individual level (Kishor and Johnson 2004; Abramsky, Watts et al.), I created a variable to control for the proportion of currently partnered women in the cluster who were married. To further control for the known increased risk of partner violence among women who are formerly partnered, I included a control variable for the cluster level proportion of women who were divorced or separated. Finally to account for any additional cohort or generational effects, I created a control variable for proportion of ever-partnered women in the cluster who were younger than 20.

Eliminating unstable clusters. Aggregating individual-level measures to represent group characteristics in ecological and multilevel studies is a well-accepted practice (Blakely and Woodward 1999). Clusters with only a few respondents, however, can yield unstable estimates because a single observation can easily skew cluster-level means (Guo and Zhao 2000). To help avoid this issue, I removed from the data set all clusters having fewer than six observations from which to establish cluster means. These "small clusters" represented 14% of the combined clusters in Brazil and Peru, or 67 of 466 total clusters. This leaves 399 clusters for inclusion in the ecological analysis.

7.2.4 Statistical analysis

This study used ordinary least squares regression in STATA version 11.2 (StatCorp, College Station Texas, 2009) to model the potential association between mean prevalence of partner violence experienced by women while living in that cluster, with various cluster-level exposure factors. I used

scatterplots to examine the data for outliers and check for linearity, and a correlation matrix to identify any highly correlated variables. Multicollinearity was formally assessed by making sure that the variance inflation factor for all variables was less than 10. I checked for heteroscedasticity by plotting the regression residuals versus the fitted predicted values, using the *rvfplot* command in STATA . I used the Breusch-Pagan test to confirm formally that the variance of the residuals were homogenous.[24] Finally, I tested for specification error using the *linktest* command, which tests whether the addition of a new dummy variable significantly improves the fit of the model. Results of these tests are available in Appendix E.

7.3 Findings

Table 7.1 summarizes the estimates by site of the mean proportion of women in each cluster who have experienced IPV-WHO while living in that cluster, as well as cluster-level estimates of key control and exposure variables. As expected, the average cluster-level mean of IPV-WHO is considerable higher in Lima and Cuzco (0.35 and 0.55) than in the Brazilian sites (0.16 and 0.25). The average proportion of cohabiting men under 25 by cluster is relatively low in all sites, varying from .03 in Sao Paulo to .09 in Pernambuco, suggesting that variation in this factor is unlikely to confound the results of other measures. The average proportion of ever-partnered women who are divorced or separated varies from 0.10 in Pernambuco to 0.15 in Lima whereas the average cluster proportion of women formally married fluctuates from 0.45 in Pernambuco to 0.59 in the department of Cuzco.

Average cluster-level means of the acceptance of wife beating and more traditional gender norms vary greatly among the sites, as does the average proportion of men in each cluster who object to family planning (range: 0.02 in Sao Paulo to 0.15 in Cuzco). Likewise, the cluster-level mean of male control of female behavior in Cuzco (1.9) is more than double that in Sao Paulo (0.8).

[24] The null hypothesis of the Breusch-Pagan test is that the variance of the residuals are homogenous. If the p-value is very small, one has to reject the hypothesis and accept the alternative hypothesis that the variance is not homogenous.

Table 7.1 Description of key outcome and exposure variables for the clusters, by site

Variable name	Outcome or exposure	Average across all clusters with ≥ 6 respondents				Total (Std dev)
		Sao Paulo	Pernam-buco	Lima	Cuzco	
	Outcome variable					
ccomviol	Proportion of women experiencing partner violence while living in cluster (min-max)	0.16 (0-.042)	0.25 (0-0.65)	0.35 (0-0.89)	0.55 (0-0.95)	.34 (SD=.22)
	Control variables					
cyoungmen2	Proportion of cohabiting male partners in cluster under 25 years	0.03	0.09	0.05	0.06	.06 (SD=.08)
cyoungwomen	Proportion of ever partnered women in cluster under 20	0.28	0.33	0.32	0.30	0.31 (SD=.13)
crelatstat	Proportion of ever-partnered women in cluster who are divorced or separated	0.11	0.10	0.15	0.13	0.12 (SD=.11)
cmarried	Proportion of cohabiting women who are formally married	0.55	0.45	0.56	0.59	0.53 (SD=.21)
	Sociodemographic variables					
csecondary	Proportion of women in cluster completing secondary school	0.46	0.20	0.68	0.35	0.42 (SD=.30)
clowses	Proportion of of households in cluster in bottom tercile of SES	0.26	0.28	0.11	0.30	0.22 (SD=.28)
	Norms					
cacceptvio	Cluster level mean acceptance of wife beating (range 0–3.0)	0.1	0.7	0.6	2.4	1.0 (SD=1.05)
cnorms2	Cluster level mean of women with traditional gender norms (range 0–3.0)	0.8	2.1	0.8	2.0	1.5 (SD=0.67)
	Women's economic status					
cearns	Proportion of women in cluster earning cash income	0.67	0.39	0.67	0.60	0.57 (SD=.21)
cnoproperty	Proportion of women in cluster who own no property (land, house, business)	0.44	0.46	0.54	0.39	0.45 (SD=.21)
	Alcohol availability and drinking norms					
cfreqdrunk3	Cluster level mean of frequent partner drunkenness (range 0–3.0)	0.3	0.7	0.8	1.2	0.8 (SD=0.5)

Notes: * 0 = never drunk. 1= once a month or less. 2= daily or weekly.

Table 7.1 Description of key outcome and exposure variables for the clusters, by site (cont'd)

	Male behavior/dominant masculinity					
ccontrol2	Cluster level mean of male control of female behaviour	0.8	1.2	1.2	1.9	1.3 (SD=0.7)
cotherwomen2	Proportion of ever-partnered women who report their partner has had outside sexual partners	0.11	0.26	0.23	0.27	.23 (SD=.15)
cfamplan2	Proportion of cohabiting partners in cluster who object to family planning	0.02	0.05	0.09	0.15	.08 (SD=.09)
cfight2	Proportion of cohabiting partners in cluster who have fought with other men (since woman has known him)	0.06	0.07	0.07	0.16	.09 (SD=.11)
	Male unemployment					
cunemploy2	Proportion of cohabiting partners in cluster who are unemployed	0.07	0.11	0.08	0.07	.08 (SD=.10)
	Neighbourhood trust and cohesion					
ccrime2	Proportion of households at cluster level that are moderately or very concerned about crime in their neighborhood (min-max)	0.06 (0-12.5)	0.05 (0-12.5)	0.08 (0-17.0)	0.05 (0-12.5)	0.06 (SD=.21)
ccrime3	Proportion of householdelds at cluster level that experienced crime in the past 4 weeks	0.003	0.006	0.008	0.008	0.005 (SD=.02)
ctrust	Proportion of women in cluster who trust their neighbours in matters of lending and borrowing	0.52	0.72	0.51	0.69	0.62 (SD=.20)
ccommunity	Proportion of women in cluster who know their neighbours well	0.53	0.85	0.67	0.78	0.72 (SD=.20)

Correlation analysis. Analysis of the bi-variable correlations among variables yields some interesting findings. As illustrated in Table 7.2, the proportion of women experiencing partner violence by cluster appears to be associated with 13 of the 16 variables tested. It is strongly correlated at the bi-variable level with the cluster's level of partner drunkenness, the acceptability of wife beating, and the intensity of male control of female behavior—a variable that I use as a measure of norms around male entitlement and dominance. With the exception of community trust and cohesiveness, all significant correlations go in the direction hypothesized. The prevalence of partner violence, for example, increases as the level of female education in the cluster declines. By contrast, the level of partner violence is actually higher in communities with more trust and cohesion, which runs counter to my initial expectations.

Table 7.2: Correlation matrix of key outcome and covariates (in clusters >6 respondents)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
(1)	% of women experiencing partner violence while living in cluster	1.0																			
(2)	% of cohabiting male partners in cluster under 25 years	0.11*	1.0																		
(3)	% of ever-partnered women in cluster divorced or separated	§	§	1.0																	
(4)	% of women in cluster who are formally married	§	§	-0.16*	1.0																
(5)	% of women in cluster completing secondary school	-0.22*	-0.26*	0.15*	0.11*	1.0															
(6)	% of households in cluster in bottom tercile of SES	0.19*	0.13*	-0.12*	§	**-0.60***	1.0														
(7)	Cluster-level mean acceptance of wife beating	**0.63***	0.16*	§	0.17*	-0.45*	0.47*	1.0													
(8)	Cluster-level mean of women with traditional gender norms	0.34*	0.26*	-0.14*	§	**-0.80***	0.52*	**0.64***	1.0												
(9)	% of women in cluster earning cash income	§	-0.29*	0.21*	§	0.54*	-0.34*	-0.17*	-0.53*	1.0											
(10)	% of women in cluster who own no property	-0.22*	§	§	-0.21*	0.29*	-0.25*	-0.40*	-0.32*	§	1.0										
(11)	Cluster-level mean of frequent partner drunkenness	**0.62***	0.12*	-0.19*	§	-0.10*	§	**0.55***	0.30*	§	-0.18*	1.0									
(12)	Cluster-level mean of male control of female behavior	**0.58***	0.15*	-0.26*	§	-0.28*	0.22*	**0.55***	0.37*	-0.12	-0.24*	**0.62***	1.0								
(13)	% of cohabiting women reporting partners having had outside sex	0.35*	§	-0.27*	§	§	§	0.15*	0.21*	-0.15*	§	0.45*	0.37*	1.0							
(14)	% of cohabiting partners in cluster who object to family planning	0.45*	0.10*	§	0.18*	-0.14*	0.17*	0.46*	0.24*	§	-0.23*	0.43*	0.46*	0.19*	1.0						
(15)	% of cohabiting partners in cluster who fight with other men	0.42*	§	-0.19*	§	-0.25*	0.26*	0.44*	0.28*	§	-0.21*	0.38*	0.40*	0.26*	0.36*	1.0					
(16)	% of cohabiting partners in cluster who are unemployed	§	§	-0.10*	-0.19*	-0.19*	§	§	0.13*	§	§	§	-0.14*	0.14*	§	§	1.0				
(17)	HH with member victim of crime in last weeks	§	§	§	§	0.13*	§	§	§	0.15*	§	§	§	§	§	§	§	1.0			

(18)	HH concerned or very concerned abou crime in cluster	§	-0.16*	0.16*	§	0.49*	-0.29*	-0.23*	-0.40*	0.35	0.15*	§	-0.14*	§	§	§	§	0.19*	1.0	
(19)	% of women in cluster who trust neighbors in borrowing and lending	0.18*	0.20*	§	§	**-0.56***	0.43*	0.48*	**0.62***	-0.41*	-0.27*	§	0.18*	§	0.21*	0.18*	§	§	-0.40*	1.0	
(20)	% of women in cluster who know their neighbours well	0.33*	0.26*	§	§	**-0.59***	0.38*	0.48*	**0.67***	-0.44*	-0.23*	0.27*	0.26*	0.17*	0.21*	0.23*	§	§	-0.29*	**0.61***	1.0

Notes: * Significant, p ≤0.05. § Not significant, p >0.05. **Boldface and highlight** indicates a strong correlation at ≥ 0.55. All partner-related variables are as reported by women.

A number of additional variables are moderately to highly correlated, as demonstrated in Table 7.2 (between 0.55 to 0.80). The following variables are positively and strongly correlated with each other at a cluster (i.e. neighborhood) level:

- Level of traditional gender norms and acceptance of wife beating
- Acceptance of wife beating, frequency of partner drunkenness, and male control of female behavior
- Proportion of HH who trust and know their neighbors well and traditional gender norms
- Knowing one's neighbors well and trusting them in matters of borrowing and lending.

By contrast, the following neighborhood level characteristics are strongly negatively correlated:

- Proportion of low income households and level of female secondary education in the cluster
- Traditional gender norms and level of female secondary education in the cluster
- Community trust and cohesion (people knowing each other well) and level of female secondary education in the cluster.

I used scatterplots to explore whether the variables that showed no significant association in bi-variable analysis, may actually vary in their association, by country (Brazil versus Peru).

Indeed, the proportion of women working for cash, which appears as nonsignificant at the bi-variable level in the combined sample, actually appears to be negatively correlated with the proportion of women who have experienced partner violence when examined separately for Brazil and Peru. Regressing working for cash on cluster-level partner violence yields a large and highly significant negative association between the two variables. The beta coefficient is –0.19 in both countries.

Figure 7.2: Scatterplot of cluster-level partner violence by proportion of women in cluster who work for cash (combined sample)

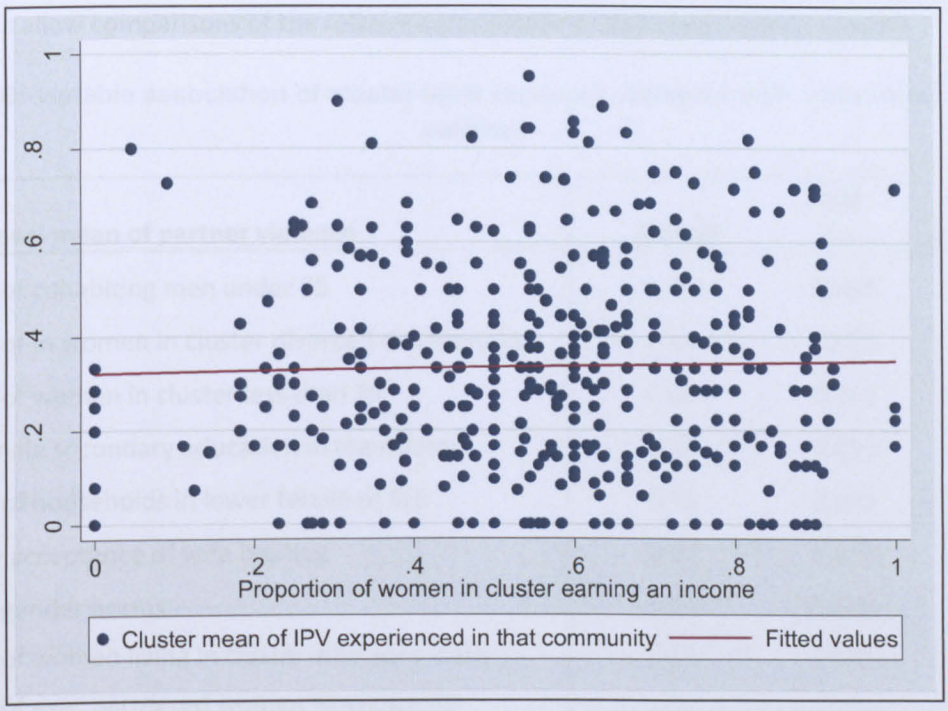
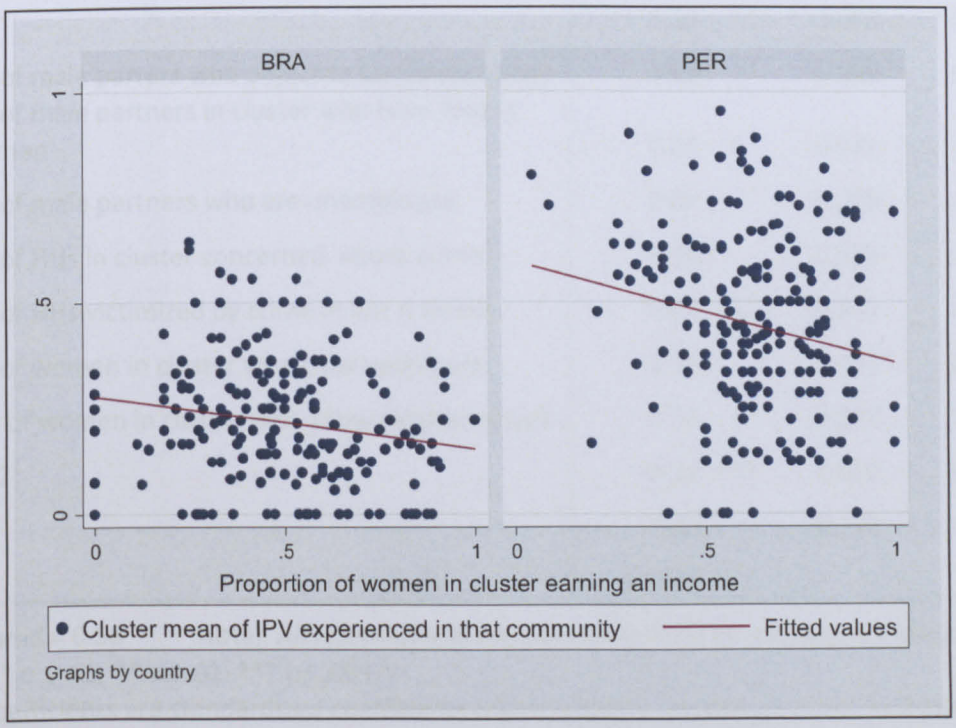


Figure 7.3: Scatterplot of cluster-level partner violence by proportion of women in cluster who work for cash, by country



Multiple regression. Table 7.3 displays all of the variables combined into a full multi-variable regression model, displaying both the coefficient for each variable and its beta coefficient. Beta coefficients are the coefficients expressed in standard deviations instead of in the units of the original exposure and outcome variables. By putting the variables on the same scale, the beta coefficients allow comparisons of the relative contribution of each explanatory variable.

Table 7.3 Bi-variable association of cluster-level exposure variables with mean level of partner violence

Cluster-level mean of partner violence	*B coeff.*		Std. Err.	*p* value	β
Proportion of cohabiting men under 25	0.08		0.098	0.444	0.028
Proportion of in women in cluster divorced or separated	0.14	§	0.071	0.058	0.070
Proportion of women in cluster less than 25	0.00		0.001	0.494	-0.025
Level of female secondary education in the cluster	-0.16	**	0.052	0.003	-0.221
Proportion of households in lower tercile of SES	-0.03		0.035	0.391	-0.038
Community acceptance of wife beating	0.04	**	0.016	0.011	0.197
Traditional gender norms	-0.01		0.020	0.757	-0.023
Proportion of women living in cluster who earn cash	0.13	**	0.046	0.006	0.121
Proportion of ever partnered women who own no property (land, house, business)	0.03		0.039	0.509	0.025
Frequent drunkeness among cohabiting men in cluster	0.08	***	0.023	0.001	0.172
Norms justifying male control of female behavior	0.05	***	0.015	0.001	0.154
Proportion of male partners in cluster with outside sex partners	0.20	***	0.058	0.001	0.134
Proportion of male parters who object to family planning	0.08		0.095	0.422	0.033
Proportion of male partners in cluster who have fought with other men	0.15	§	0.081	0.059	0.074
Proportion of male partners who are unemployed	-0.07		0.079	0.362	-0.032
Proportion of HHs in cluster concerned about crime	-0.06		0.209	0.788	-0.011
Proportion of HHs victimized by crime in last 4 weeks	-0.61	§	0.342	0.077	-0.060
Proportion of women in cluster who trust neighbors	-0.06		0.051	0.230	-0.057
Proportion of women in cluster who know neighbors well	0.10	*	0.052	0.052	0.095
_ICountry_2	0.12	***	0.030	0.000	0.267
_constant	0.02		0.074	0.828	
	N=399				

Adj R-squared = 0.58 Note: *All references to male partners refer to cohabiting male partners*

§ p ≤ 0.1 * p ≤ .05 ** p≤ .01 *** p≤ .001

a = Beta coefficients are standardized coefficients that represent the change in the independent variable (measured in standard deviations) that yields one standard deviation change in the dependent variable.

This analysis suggests that of my potential control variables (proportion young men, proportion young women, proportion of ever-partnered women who are separated or divorced[25]), only the cluster-level proportion of women who are divorced or separated is significantly associated with the mean level of partner violence. Additionally, the following variables do *not* predict cluster levels of partner violence:

- Cluster-level proportion of cohabiting men who are unemployed
- Cluster-level proportion of households in the bottom tercile of SES
- Cluster-level proportion of cohabiting men who object to their partners' using family planning
- Cluster-level proportion of women who do not own assets (home, land, or business)
- Cluster-level proportion of women who trust their neighbors in matters of lending and borrowing

The level of fighting among men and the proportion of households victimized by crime in the past 4 weeks are both marginally significant.

Removing all variables that are not significant at the $p=<0.1$ level leaves the following final model as depicted in Table 7.4. The proportion of households that experienced a crime in the last 4 weeks did not achieve significance in the reduced model, so it is not included in Table 7.4.

[25] Cluster level percentage of cohabitating women who are formally married was not significantly correlated in bi-variable analysis. I did not add the cluster-level variable into the final model because it had missing data and thus reduced the number of clusters available for analysis.

Table 7.4 Multi-variable association of cluster-level exposure variables with mean level of partner violence

Cluster-level mean of partner violence among women	B coeff.		Std. err.	*p* value	β
Proportion of in women in cluster divorced or separated	0.14	*	0.071	0.044	0.07
Level of female secondary education in the cluster	-0.17	***	0.039	0.000	-0.23
Level of community acceptance of wife beating	0.03	*	0.012	0.018	0.10
Proportion of women living in cluster who earn a cash income	0.12	**	0.044	0.008	0.11
Level of frequent drunkenness among cohabiting men in cluster	0.10	***	0.022	0.000	0.22
Male control of female behavior in cluster (male dominance norms)	0.05	***	0.015	0.001	0.16
Proportion of male partners in cluster with outside sex partners	0.16	**	0.055	0.003	0.11
Proportion of male partners in cluster who have fought with other men	0.18	*	0.078	0.019	0.09
Proportion of women in cluster who know neighbors well	0.09	*	0.046	0.052	0.08
_Icountry_2	0.14	***	0.023	0.000	0.32
	N=399				

The strongest explanatory variables, as indicated by the Beta coefficients (β), include the proportion of women completing secondary school, the degree of male control over female behavior (norms of male control/dominance), the proportion of households in which a partner routinely becomes drunk (once a week or more), and country. For example, as the proportion of women completing secondary education increases by one standard deviation in a cluster, the prevalence of partner violence decreases by 0.23 standard deviations. A substantial degree of variance also adheres to the dummy variable for country, suggesting that some of the factors related to the geographic distribution of partner violence operate at a "higher," or more macro-level than that of the cluster or neighborhood. Alternatively, this variance may reflect major distinctions between Brazil and Peru on the prevalence of various individual-level risks factors.

Intriguingly, the proportion of women working for cash goes from being nonsignificant in the correlation matrix to having a positive and significant impact on the cluster level prevalence of partner violence. This suggests a degree of negative confounding where the occurrence of other factors can attenuate the apparent effect. In other words, the unadjusted estimate of effect of the proportion of women working for cash actually underestimates the adjusted effect. Further analysis suggests that the cash variable at a cluster level is strongly confounded by the dummy variable for country. It appears that when examined at the bi-variable level by country, the proportion of women working for cash is negatively correlated with the level of partner violence. In the final odel, the extent of women working for cash is positively and significantly associated with the geographic distribution of partner violence. The fact that the direction of effect changes in the adjusted model, makes this an example of qualitative confounding (Szklo and Nieto 2007).

The final model depicted above has an adjusted R-squared of 0.59, suggesting that these nine variables, together with a dummy variable for country, account for roughly 59% of the total variance in mean rates of partner violence by cluster. By social science standards, this represents a high degree of explanatory power (Cohen 1988).

Post-estimation tests confirm that the model meets the statistical demands of least squares regression, including linearity and the normality of the residuals, and lack of multicollinearity (See Appendix E for details of post regression tests).

7.4 Discussion

7.4.1 Drivers of population-level risk

This analysis reveals some interesting insights regarding potential drivers of the prevalence of partner violence at a population level. Significantly, norms regarding male dominance (control of female behavior) and the acceptability of wife abuse appear among the strongest social forces shaping the geographic distribution of partner violence in Brazil and Peru. The higher the average level of "patriarchal control" and the more reasons endorsed for justifying wife beating in a community, the more common partner violence appears in that setting.

These findings are not surprising. Tolerance of wife beating and male control/dominance are both foundational elements in feminist theories of partner violence, which view the abuse of women as deriving from gender regimes that grant men superior power and social authority (Dobash and Dobash 1979; Jewkes 2002). Especially in traditional societies, men and women's family roles are highly structured, with women expected to bow to male authority. Where women fail to conform to gendered expectations, society grants social permission to men to "discipline" their wives. This is especially common in socieities where the practice of bride price reinforces the notion that women are men's property (Mvundudu 2002).

While notions of women as property may no longer define gender relations in Brazil or Peru, remnants of patriarchal culture persist, and they still inform day-to-day negotiations between men and women, especially in the family. Both the Catholic church and newer evangelical churches continue to promote the patriarchal family as "natural" and ordained by God, which reinforces notions of male authority and female subservience. Despite dramatic shifts in economic and social

forces, traditional gender ideologies and norms persist. Indeed, 38% percent of reproductive age women in Pernambuco, and 41.7 of women in Cuzco still endorse one or more justifications for wife beating. Few researchers today would argue that patriarchy alone explains differences in partner violence among settings. Nevertheless, this study suggests patriarchy still plays a part, at least at a community level.

Given the salience that norms and patriarchal control play in the feminist discourse on violence in general, it is surprising that so few studies have evaluated the role of gender norms in the distribution of partner violence. Rather than focusing on community-level variables, most studies have conceptualized acceptance of partner violence and male control as "attitudes" and "behaviors" respectively, and have measured both at the individual level. These studies in turn either explore what individual-level factors (such as education) predict tolerance of wife beating (Rani, Bonu et al. 2004; Flood and Pease 2009; Rani and Bonu 2009; Uthman, Lawoko et al. 2009), or less commonly assess whether attitudes supportive of wife beating or male dominance predict risk of either partner violence perpetration or victimization (Fournier, de los Ríos et al. 1999) (Smith 1990)(Khawaja, Linos et al. 2008; Huang, Zhang et al. 2010).

By contrast, I conceptualize male control as an ideology that helps give rise to norms that tolerate and sustain partner violence. These norms and systems of belief both reflect the wider distribution of male/female power in society [the gender regime] and reinforce gendered practice in the family and intimate relationships. I maintain that norms are likely more relevant to the distribution of partner violence than individual-level attitudes (Pease and Flood 2008). Unlike an attitude, gender-related norms structure all dimensions of the partner violence problem: they inform which behaviors are considered acceptable for women, how victims are viewed, how a man should respond if his authority is challenged, whether the family is considered a private domain, whether family members would support or blame the woman if she leaves, and how professionals and providers would respond. As Pease and Flood, observe in their article, "Rethinking the significance of attitudes in preventing men's violence against women, "Personal dispositions may be less important than social context and social norms in determining behavior (Pease and Flood 2008)."

Intriguingly, the ecological analysis reveals that in addition to male control of female behavior, the extent of male drunkenness, outside sexual partners, and men fighting with other men are factors also associated with community rates of partner violence. These associations could have several explanations. The association with drunkenness, for example, could be a marker for unfettered alcohol availability along with norms that encourage binge drinking. Both factors have been associated with increased rates of problematic drinking in other ecological studies (Livingston 2010). Community-level drunkenness was also significantly associated with the prevalence of male fighting in the bi-variable analysis (pw corr=0.38), which might also reflect the impact of alcohol availability and drinking norms on the frequency of fights. Despite their relation at a cluster level, both factors independently increased the cluster-level mean of partner violence in the final model.

This specific clustering of factors might also derive in part from a construction of masculinity that links "maleness" to being tough, having multiple sexual partners, keeping one's partner in line, and avenging real or imagined threats to one's authority or honor. This particular constellation of beliefs is closely aligned with the cultural notion of machismo—an exemplar of manhood that has its roots

in Mexican culture, but has spread widely throughout many parts of Latin America. Research in Brazil and Peru, among others, confirm that machismo persists as the masculine ideal against which young men commonly construct and enact their male identities (Gonzalez 1996; Arciniega, Anderson et al. 2008). Although a cultural anachronism for many men, machismo is still a reference point for hegemonic masculinity and gender practice throughout the region.

Without further research, it is impossible to know whether the community markers for partner violence that emerge in this study—male fighting, drunken behavior, outside sexual partners and male control—each signify a separate community dynamic or whether they share a common foundation in masculinity norms. Several authors, however, have observed that "manhood" as opposed to womanhood, is seen as something achieved, rather than ascribed (i.e. not a developmental certainty). As such, boys and men struggle to earn and maintain a sense of manhood by enacting various signifying behaviors that serve to prove their masculinity to others (Gilmore 1990); (Vandello, Bosson et al. 2008). In Latin American settings where machismo represents a cultural model of manhood, all of the above behaviors (drinking, womanizing, and fighting) could be seen as signifiers of a certain type of masculinity, one that is strongly linked to male dominance in the family and control of female behavior.

A third finding, no less significant, is the strong negative association between female secondary education and the spatial distribution of partner violence. Rates of partner abuse are significantly lower in communities where women on average are more educated (defined as completing secondary education). Without controlling for individual-level educational attainment, it is impossible to discern whether the association at the cluster level reflects who lives in a particular neighborhood (a compositional effect) or whether it suggests a higher order contextual effect. It could easily signify both, with community levels of education reflecting both the composition of neighborhoods but also less tangible factors such as greater access to media and alternative role models, exposure to new ideas, and more expansive social networks.

Studies of predictors of partner violence at an individual level, for example, find a strong association between secondary education and risk of partner violence (Abramsky, Watts et al. 2011). There is also a strong association between educational achievement and attitudes condoning partner violence in a wide range of developing country settings. In pooled analysis of predictors of attitudes toward partner violence across 17 countries in sub-Saharan Africa, for example, the adjusted odds of accepting wife beating were higher among young people, among individuals living in rural areas, and in households where men had the final say over more household decisions. Acceptance of partner violence was lower among the more educated, those with greater access to media, and when respondents reported more decisions being made jointly in the household (Uthman, Lawoko et al. 2009). These results and the community-level findings of this chapter, suggest that expanding access to higher-level education is a potentially important mechanism for reducing overall rates of partner violence.

A final area of inquiry involved two concepts that were measured from the start at the household and community level: extent of neighborhood crime and social capital. The WHO survey originally included measures of crime and social capital in order to test whether rates of partner violence

appear higher in settings where other forms of violent crime are common and lower in settings where social capital is high.

In my analysis, neither the level of criminal victimization reported by the household nor their level of concern over crime in their neighborhood was associated with levels of partner violence. Although the level of criminal victimization in the past four weeks appeared weakly significant in the bivariate level, this effect was not sustained in the final model.

I could find no other study in the literature that explored the specific question of whether levels of neighborhood crime co-vary with spatial distribution of partner violence. There are a handful of studies that examine whether concentrated neighborhood disadvantage—a neighborhood feature that is frequently associated with higher rates of crime—increases a woman's individual risk of partner violence. The evidence on this matter is mixed, with some evidence suggesting it is (Miles-Doan 1998; DeKeseredy, Schwartz et al. 2003; Raghavan, Mennerich et al. 2006) and a recent study from Sao Paulo suggesting it is not (Kiss, Schraiber et al. 2012). This latter study, which also analyzed the WHO data, found that that while women living in disadvantaged neighborhoods do have higher rates of partner violence, this was a function of who lived in these neighborhoods rather than a true contextual effect.

The second community level measure was of social capital, defined here as the norms and networks that give people the means, knowledge and opportunities for collective action (Woolcock & Narayan 2002; Krishna & Shrader 2002). Despite (or perhaps because of) its ability to invite conversation across disciplines, social capital is a contested category that has come to mean different things in different disciplinary domains. Sociologists, economists, and social psychologists tend to conceptualize social capital as an asset of individuals, or specifically as the potential benefits that accrue to individuals because of their insertion into networks or broader social structures (Portes 2000). By contrast, political scientists tend to conceptualize social capital as a feature of communities, equating it with notions of "civic spirit" and the community norms, networks and trust that facilitate joint action. As Robert Putnam the most prominent advocate of the latter approach observes, "Working together is easier in a community blessed with a substantial stock of social capital." (Putnam 1993, pp. 35-36).

In the violence and public health literature, social capital has generally been theorized as a resource available to individuals, families or communities—like financial and human capital—that can help them achieve shared goals and overcome adversity. A recent study in North and South Carolina, for example, found that the odds of partner violence were significantly lower in households from neighborhoods with high social cohesion and sense of community (aOR 0.62: 95% CI:0.39-0.97) compared to low social capital neighborhoods (Zolotor and Runyan 2006). In adjusted analysis, for each 1 point increase in social capital (measured by a multifaceted index), the household odds of partner violence was reduced by 30%.

Although the WHO study included five questions related to social capital, these did not correlate well with each other, and thus they could not be combined as an index. When aggregated at a cluster level, knowing your neighbors well was the only item that remained significantly associated with mean partner violence in multi-variable regression. Contrary to initial expectations,

communities in Brazil and Peru where people knew each other well, however, experienced more partner violence than did other communities.

Without further research, it is difficult to know how to interpret this finding. I had originally theorized that communities with greater social capital would have reduced rates of violence because greater social cohesion and group efficacy might imply a greater willingness and ability to intervene to stop abuse. This hypothesis was based on insights from ecological studies of coded ethnographic data that demonstrated that wife beating is less common in cultures where community members intervene in marital disputes and exert sanctions on men who beat their partners (Levinson 1990).

Upon reflection, however, a negative relationship between partner violence and community cohesion does not necessarily run counter to social theory. Social capital theorists point out that the effects of affiliation and community norms are not always positive. Community cohesion, social control and collective sanctions can be applied to enforce conformity to social expectations—for example around gender norms—just as easily as to encourage progressive change. The same "strong ties" that provide fodder for positive action, can also be used to restrict personal freedoms and enforce regressive norms. It is possible that in countries where gender norms and are in flux, tight communities stigmatize women who challenge dominant norms and make it harder for women to leave abusive relationships.

Indeed, one study in Chicago found that neighborhood collective efficacy—a construct similar to social capital that combines social cohesion and informal social control—interacted with "nonintervention norms"[26] when predicting levels of severe partner violence. As I originally hypothesized, the average effect of neighborhood collective efficacy was negative and significantly associated with partner violence over and above individual and relationship factors that increase risk. In other words, women living in communities with higher collective efficacy had lower risks of partner violence. However, in neighborhoods where norms against intervention were more prevalent, the risk of partner violence was higher. The positive and significant effect of the interaction term indicates that as nonintervention norms become more prevalent, the protective effect of collective efficacy declines. The study also found that in neighborhoods with greater collective efficacy, women were more willing to disclose partner violence to family, friends, or authorities (Browning 2002).

Although the Chicago study was examining the effect of collective efficacy on *individual* risk of violence (rather than average neighborhood levels), it nonetheless does support the notion that the impact of social capital or collective efficacy may be influenced by community norms. This fact suggests that future studies would benefit from pairing qualitative research with quantitative measures of social capital to help articulate the exact impact of social networks and community norms on individual assets and behavior.

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[26] The exact question asked respondents to note their degree of endorsement on a 5-point Likert to the statement "fighting between friends or within families is nobody else's business."

7.4.2 Promising avenues for future research

This study highlights the potential importance of interventions aimed at community level norms and processes as a strategy to reduce partner violence in Brazil and Peru. An important next step would be to supplement ecological analysis with additional qualitative and multilevel studies to explore the meaning of the observed associations. Qualitative research and participant observation could help elaborate and compare gender norms and notions of masculinity in high versus low violence communities. Do people in these settings perceive that local norms structure violent behavior? Additional quantitative work using multilevel modeling could interrogate whether observed cluster-level associations persist once individual level effects are taken into account.

The findings regarding community level measures of male control of female behavior warrant special investigation. At an individual level, a woman whose partner exhibits more controlling behaviors has increased odds of experiencing violence by her partner.

It is yet unclear, however, exactly what the WHO Controlling Behaviors Scale actually measures. Does it tap deep-seated psychological needs among some men to control their partner (perhaps due to some unresolved issues around attachment), or does it reflect primarily the degree to which men endorse and internalize male dominance norms. In the former case, the scale measures an individual psychological feature rather than merely internalization of the reigning gender regime. This distinction is potentially important when moving on to multilevel studies, because it affects whether one would want to include controlling behavior as an individual measure in addition to the aggregated measure of male dominance used in this chapter to signify norms related to male control of female behavior.

7.4.3 Strengths and limitations of the analysis

This study has both significant strengths and weaknesses. One strength is the study's interrogation of factors operating at a community level in determining the spatial distribution of partner violence. The majority of scholarship to date has focused exclusively on individual level determinants of partner violence. A further strength is the study's careful construction of exposure variables such that factors presumed to work at the community level are derived only from respondents known to have lived in the cluster at the time of the survey.

Despite this care, a limitation is that the exposure variables are based exclusively on information provided by women—a reality that is particularly limiting when attempting to represent the situation or behaviors of men. Moreover, because the WHO survey only collected information on women's current or most recent partner, the data set contains no information on men who have never been partnered or from currently single men whose last partner has already taken up with a new partner. The situations of these men are not included in the community level variables created from aggregated responses at a cluster level.

Indeed, the strategy of generating community-level variables by aggregating individual-level responses presents a number of conceptual and methodological challenges. First, the aggregated cluster level variables are from the same data source as the individual level variables; ideally, the neighborhood data would come from an entirely separate source. Second, some of the clusters are

relatively small and have only six cases available for calculating exposure means. This may make some of the aggregated means unstable. Third, sampling clusters may be a poor proxy for the geographic and "social" boundaries of a neighborhood (Duncan and Aber 1997). Fortunately, incorrect specification of neighborhood or community boundaries would probably cause an underestimation of neighborhood effects due to the introduction of nondifferential misclassification bias. So, while a potential source of error, it is unlikely to give rise to a spurious positive finding.

The strategy also presents special challenges for the question of measuring social norms. Norms are shared expectations of specific individuals or groups regarding how people should behave {(Paluck and Bell 2010). They act as powerful motivators either for or against individual attitudes and behaviors, largely because individuals who deviate from group expectations are subject to sanctions or disapproval by others who are important to them. Norms most properly should be measured at the level of the group, but of necessity, I had to rely on aggregating individual attitudes and practices to approximate group expectations. My approach necessarily assumes that cluster-level neighbors represent an important normative reference group for respondents, which may or may not be the case.

Finally, this analysis cannot determine the extent to which the ecological associations observed at the cluster level may partially reflect the characteristic of the individuals living there.

Chapter 8: Macro-Level Influences on Population Prevalence of Intimate Partner Violence

Guiding questions

1. What macro-level factors are associated with the geographic distribution of partner violence across different countries and sites?
2. What do such findings suggest regarding macro-level policies that might help reduce overall levels of partner violence?

8.1 Background

As described in section 2.4.4 advocates and researchers have put forward a number of different macro-level factors as potentially relevant to the distribution of both individual and population-level risk of partner violence. Among those factors hypothesized as relevant, have been:

- Various measures of economic and social inequality between men and women;
- Measures of absolute achievement among women in terms of educational attainment, entrance into the wage economy, etc:
- Levels of militarism or acceptance of violence as a way to resolve conflict;
- Degree of modernization and/or engagement with the global economy; and
- Various belief and normative systems (e.g. regarding gender relations, acceptance of wife abuse).

Although a number of these hypotheses have been tested in cross national studies (Archer 2006; Ackerson, Kawachi et al. 2008; Asal and Brown 2010; Kaya and Cook 2010), most studies have suffered from serious conceptual and methodological limitations. They either have used outcome measures of questionable quality or drawn from noncomparable studies (Archer 2006; Palma--Solis, Vives-Cases et al. 2008; Asal and Brown 2010), have researched settings with insufficient variation to evaluate the hypothesis under study (Yllo and Straus 1984), or have used less than ideal data to test their explanatory variables (Archer 2006). In many studies, the choice of variables to study has been driven more by the availability of data than guided by theory.

Nonetheless, the exploration of macro level factors that may drive the population distribution of partner violence is an important endeavor, both from the perspective of refining theory around the causes of domestic violence as well as suggesting avenues for intervention at a national or state policy level.

This chapter will explore a number of different hypotheses regarding potential macro-level drivers of the geographic distribution of partner violence. Specifically, it will test a set of inter-related

hypotheses, as they relate to the population prevalence of current partner violence. The following factors are hypothesized to be negatively associated with a country's level of partner violence:

- A country's overall level of economic development
- Women and girls' achieved status and implicit value in the society.

The following are hypothesized to be positively associated with rates of partner violence:

- Norms related to acceptance of wife beating and male control of female behavior (male entitlement or dominance norms)
- Level of gender inequality in access to rights and resources
- Barriers to women leaving abusive relationships (e.g. unequal rights to inheritance, child custody; relative social acceptance of divorce)
- Level of male alcohol consumption and drinking norms

8.2 Data sources and methods

This chapter draws on three primary sources of data: 1) household surveys of domestic violence conducted in low and middle-income countries, such as the Demographic and Health Surveys (DHS); 2) national level statistics compiled by the United Nations, the World Bank, or the Organisation for European Co-operation and Development (OECD); and topic specific data bases compiled by academic institutions to track specific issues, such as women's economic rights as recognized in law. Specific measures and sources are described in Table 8.1.

8.2.1 Outcome variable

The outcome variable for this analysis is the population prevalence of *current partner violence*, defined as the experience of one or more acts of physical and/or sexual violence within the past 12 months by a current or former intimate partner

Data for this outcome variable are drawn from four primary sources: 28 Demographic and Health Surveys (DHS) carried out in developing countries between 2000 and 2010; the WHO Multi-country Study of Domestic Violence and Women's Health, conducted in 15 sites in 10 countries between 2000 and 20004; replication studies of the WHO multi-country study undertaken after the original WHO study (e.g. Turkey, Maldives, and New Zealand); and a national-level survey of partner violence from Germany, which used similar measures and methods. All non-DHS surveys were conducted between 2001 and 2010.

Both the DHS and WHO studies used in-person household surveys to interview a representative sample of women 15 to 49, either nationally (in the case of the DHS and the WHO surveys conducted in the Maldives, Samoa and Turkey) or subnationally in the the remaining WHO surveys. In most instances, the WHO study included two sites, a representative sample of women from the country's capital or another major city, and a second representative survey of a primarily rural province. These data sources were selected because they represent the most comparable data available globally on the occurrence of partner violence. The DHS domestic violence module was designed in 2002 (with input from key investigators involved in the design and implementation of the WHO Study) with the

goal of making the two studies as comparable as possible. Both surveys use behaviorally specific questions about different acts of physical and sexual partner violence and apply them using in-person interviews. Although the exact wording of the acts differs slightly in the two surveys, the differences are minor. Also, all surveys followed the same set of ethical and practice guidelines designed to maximize safety and disclosure, including interviewing only one woman per household, maintaining complete privacy during the interview, and implementing specialized sensitivity training for interviewers (Hindin, Kishor et al. 2008).

Additionally, I only used surveys where I could access the original datasets for further analysis (or have the owners of the data recalculate and extract the required variables). This allowed me to generate an outcome measure that was fully comparable across studies in terms of the age of respondents included, the acts included and the denominator used. The outcome measure was defined as the percentage of ever-partnered women (minus widows without a current partner) 15 to 49 who experienced at least one act of physical and/or sexual violence within the past 12 months

For each country, national, urban, and rural prevalence estimates were calculated, and all analyses were run separately for all three levels. Data from WHO sites were either allocated as urban or rural as appropriate, with state and provincial sites designated as "rural."

I chose to focus on past year rather than lifetime partner violence for two reasons. First, the level of current partner violence varies more dramatically than ever violence between high and low-income settings, making for a more interesting comparison. Second, this focus helps avoid problems presented by the varying time frames queried in the DHS versus the WHO surveys. The DHS survey asks women only about violence perpetrated by her current or most recent partner, whereas the WHO study asks about violence perpetrated by *any* partner since the age of 15. By focusing on the previous 12 months, I maximize the comparability between surveys.

8.2.2 Explanatory variables

My choice of explanatory variables was guided by the literature, as summarized in the revised ecological framework shown in Figure 2.4 and the particular hypotheses that I wished to explore. I spent considerable time seeking out and evaluating sources of data for operationalizing the key constructs I hoped to test.

To be useful for this exercise, data had to be: 1) collected on a national basis, 2) available for a sufficient number of the countries where partner violence data were also available, 3) available for dates close to when the violence data was originally collected, and 4) accessible in the public domain. Table 8.1 summarizes the constructs I sought to capture, the specific variables I used to measure each construct, and the sources for the data.

Table 8.1 Constructs, variables and data sources for explanatory variables

Construct	Definitions of variables	Data source(s)
Level of economic development		
Level of economic development	Natural log of GDP per capita in purchasing power parity ($US 2008)	World Bank Indicators Data Base
Women's status/level of empowerment		
Educational achievement	Proportion of women ages 15 to 49 who completed secondary education	Calculated directly from individual DHS and WHO datasets for urban, rural and national-level estimates
Early marriage	Proportion of women ages 20 to 24 who were married before age 18	Table 9 of the State of the World's Children 2011; data from DHS, UNICEF's multi-cluster surveys (MICS) and other national surveys. Data for Germany, Japan and New Zealand from World Marriage Data Sheet 2008
Contraceptive Use	Proportion of currently partnered women using a modern form of contraception at the time of the survey	Calculated from each country's' DHS survey; Data on Japan, New Zealand and Germany taken from: World Contraceptive Use, United Nations, 2005.
Women's economic rights and access to waged employment		
Women's economic rights and entitlements	Specialized measure that codes the degree to which law recognizes women's economic rights and government's enforcement of these rights	Women's economic rights and entitlements (WECON) measure from Cingarenelli-Richards (CIRI) Database on Human Rights
Participation in formal waged employment	Percentage of women engaged in wage and salaried work	World Bank Indicator Data Base, based on ILO data

Women's political rights and representation		
Women's political rights	Specialized measure that codes the degree to which law recognizes women's political rights and governments enforce these rights	Women's Political Rights (WEPOL) measure from Cingarenelli-Richards (CIRI) Database on Human Rights
Women's political representation	Proportion of seats in parliament held by women	World Bank Development Indicators data base
Level of gender inequality		
Relative access to secondary education	Ratio of married women to married men completing secondary education, by site	Calculated from site and national level data from the WHO and DHS surveys
Relative enrollment in tertiary education	Ratio of female to male gross enrollment rates in tertiary education	National level data reported by countries to UNESCO, UNESCO Institute for Statistics
Relative access to waged employment	Share of female workers in the nonagricultural sector (industry and services), expressed as a percentage of total employment in the nonagricultural sector	World Bank Development Indicators data base
Women's ownership index (1=high inequality; 0 = low inequality)	Specialized measure that codes women's legal and de facto rights with respect to owning sand, accessing credit (e.g. bank loans) and owning property other than land (e.g. a house) compared to men's legal rights and de facto access	Sub-index on "ownership" of the Social Institutions and Gender Index (SIGI), published by the OECD Development Centre
Gender gap in achievement of development goals	Gender Gap Measure—The average of the ratios of female to male achievement in life expectancy, education and labor force participation, capped at 1.	(Branisa, Klasen et al. 2009)

Gender-related norms		
Acceptance of wife abuse	Mean value of scale of five situations where a man is justified in beating his wife	Calculated from DHS and WHO study data
Degree of male dominance/ control of female behavior	Proportion of women reporting that their partners exhibit three or more of a list of six controlling behaviors	Calculated from site and national level data from the WHO and DHS surveys
Ease of leaving abusive partnerships		
Social acceptability of divorce	Mean response on survey inquiring about moral acceptability of divorce	World Values Survey data, multiple years (available at: www.worldvaluessurvey.org)
Presence of discriminatory laws and practice related to child custody, marital separation, or inheritance	Hand-coded score on sub-index that measures whether women have the same rights as men related to child custody, inheritance, and marriage	Family Code sub-index of the Social Institutions and Gender Index (SIGI), published by the OECD Development Centre
Alcohol availability and drinking norms		
Male drinking behavior	Total (recorded + unrecorded) adult male (15+ years) per capita consumption over a year in liters of pure alcohol, drinkers only	World Health Organizations Global Alcohol Data Base 2008
	Percent of heavy episodic drinkers among all men -- drinks 6+ units of alcohol at one time, weekly	
	Percent of heavy episodic drinkers among all male drinkers	

For each explanatory variable tested, I used data from the same year that the violence survey was undertaken. Where an exact match was not available, the closest year to the survey date was used, giving priority to data collected prior to the date of the violence survey. In almost all cases, data on the explanatory variables were collected within two years of the date of the violence survey, often the same exact year. Data limitations meant that in a few cases, I had to use covariate data collected five or more years before the violence data were collected. This, however, applied to only a handful of cases.

Many of the variables and constructs described in Table 8.1 are self explanatory. Those requiring further elaboration are detailed below.

Measures of women's status

See Table 8-1.

Women's economic and political rights

As a measure of women's economic and political rights, I used two measures from the Cingranelli-Richards (CIRI) Database on Human Rights, a project that codes human rights practices of governments throughout the world. CIRI uses detailed coding rules to code countries based on information in the US Department of State Annual Human Rights country reports and reports by Amnesty International.

In measuring each set of rights, CIRI is primarily interested in two things: first, the extensiveness of laws pertaining to that set of rights for women; and second, *government practices* towards women or how effectively the government enforces the laws.

For example, the CIRI measure of economic rights [WECON] examines laws and practice related to:

- Equal pay for equal work
- Free choice of profession or employment without the need to obtain a husband or male relative's consent
- The right to gainful employment without the need to obtain a husband or male relative's consent
- Equality in hiring and promotion practices
- Job security (maternity leave, unemployment benefits, no arbitrary firing or layoffs, etc.)
- Nondiscrimination by employers
- The right to be free from sexual harassment in the workplace
- The right to work at night
- The right to work in occupations classified as dangerous
- The right to work in the military and the police force.

Regarding the economic equality of women, countries are coded:

(0) If there are no economic rights for women under law and systematic discrimination based on sex may be built into the law. The government tolerates a high level of discrimination against women.

(1) There are some economic rights for women under law. However, in practice, the government DOES NOT enforce the laws effectively or enforcement of laws is weak. The government tolerates a moderate level of discrimination against women.

(2) There are some economic rights for women under law. In practice, the government DOES enforce these laws effectively. However, the government still tolerates a low level of discrimination against women.

(3) All or nearly all of women's economic rights are guaranteed by law. In practice, the government fully and vigorously enforces these laws. The government tolerates none or almost no discrimination against women.

The CIRI data base includes a similar measure of political rights, known as WoPOL. In addition, I used proportion of seats in parliament held by women as a measure of women's poltical participation.

Measures of gender inequality

Ratio of female-to-male gross enrollment rates in tertiary education. This variable is conceptualized as a measure of the relative social investment in girls versus boys as well as an indirect measure of what girls can realistically aspire to in their cultural setting. It is taken from national level data reported by countries to UNESCO and available from the UNESCO Institute for Statistics.

Ratio of women-to-men completing secondary education. This measure represents the ratio between females and males completing secondary school by site, based specifically on data generated at the site and national level from the WHO and DHS surveys. Like the UNESCO indicator above, this variable provides a measure of gender inequality, but one calculated from the same data source as the violence estimates. The two measures provide complementary but different means to test the same proposition—that gender inequality predicts population levels of partner violence.

Relative ownership index. I also used a sub-index on "ownership rights" created by the Organization for Economic Cooperation in Europe (OECD) for use in creating their composite measure known as the Social Institutions and Gender (SIGI) Index. The SIGI is composed of five sub-indices designed to measure social institutions, practices and legal norms that produce inequalities between women and men.

The SIGI sub-index on ownership rights codes countries based on women's ability to own and access several types of resources. The sub-index includes three variables:

- *Women's access to land* measures women's right and de facto access to land;
- *Women access to property other than land* measures women's right and de factor access to other types of property, especially immovable property such as a house;
- *Women's access to credit* measures women's right and de facto access to bank loans.

Even though women generally have the legal right to obtain credit, the third variable also notes whether there are restrictions such as a requirement for a husband's permission or the need to put up land as collateral that could compromise women's access to credit.

The coding of countries is based on detailed country reviews and a standardized coding system. For example, women's access to property other than land is coded as follows:

0 – Women have equal rights and opportunities to property

0.5 – Women have some rights and opportunities to property, e.g. goods they received from their parents (i.e. inheritance or dowry);

1 – Women have no/few rights or opportunities to own property

The variables are scored between 0 and 1, with 0 indicating low or very little inequality and 1 indicating high inequality (compared to men).[27]

Gender gap measure. In 1995, the UNDP introduced two new composite measures designed to measure gender inequalities in development (the Gender Development Index or GDI) and gender empowerment (the Gender Empowerment Measure or GEM). Since that time, there has been a proliferation of efforts to develop improved measures of women's status and/or gender disparities in development (see Box 8.1).

After carefully assessing of the pros and cons of the available measures, I chose to use the Gender Gap Measure (GGM), a new aggregate index that incorporates several refinements on the UNDP's traditional GDI. The GGM was introduced in 2011 by two German economists, who have been working with UNDP to develop improved measures of gender inequality and women's empowerment.

The GGM is the average of the ratios of female to male achievement in life expectancy, education and labor force participation. It uses the labor force participation rates as its third indicator to circumvent the empirical and data-related problems faced by measures, such as the GDI, that rely on estimates of earned income. For mathematical consistency, the GGM uses the geometric average of the ratios:

$$GCM = \left(\frac{LEf}{LEm} \times \frac{EDf}{EDm} \times \frac{LFf}{LFm}\right)^{1/3}$$

The GGM is a direct measure of relative gender gaps in human development achievements, rather than a measure of gender sensitive development (as was the original GDI). For more information on how the two measures differ, see Box 8.1).

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[27] For more information on SIGI construction and coding, see: http://genderindex.org/content/assessment-and-coding-countries.

A practical issue is that GGM can exceed 1, especially because there are many countries (62 countries in 2003) where women enjoy a life expectancy advantage of more than five years.

Box 8.1 Evolution in aggregate measures of gender disparities in development

Since 1995, the United Nations Development Programme (UNDP) has worked hard to develop and promote a suite of indicators that seek to measure human development and gender empowerment. Based loosely on Amartya Sen's "capabilities approach," these measures are designed to capture a more fulsome notion of "development" than GDP. The core measure in this suite is the Human Development Indicator (HDI), which is an index that combines information on life expectancy, educational attainment and income.

In 1995, the UNDP Human Development Report introduced two new measures, the Gender-related Development Index (GDI) and the Gender Empowerment Measure (GEM) designed to capture gender-related aspects of development.

Contrary to popular belief, the GDI is not a direct measure of gender inequity but an attempt to measures "gender-sensitive" development. It is a penalty applied to the HDI to capture the human development losses that occur due to gender inequities. The larger the gap between men and women in achievements in life expectancy, education, and earned income, the more the GDI differs from the HDI. In effect, the GDI is the HDI discounted for gender disparities.

GEM was conceptualized as a more specialized measure focusing on the empowerment of women. The GEM is meant to measure "whether women and men are able to actively participate in economic and political life and take part in decision making (UNDP), 1995, p. 73. Emphasis is on women's agency with a penalty applied for departures from gender equality in empowerment.

UNDP chose three dimensions to include in the GEM's measure of women's agency. The first is female representation in national parliaments as an indicator of political representation and decision-making. The second is representation in the senior positions in the economy, using as a proxy, the female representation as legislators, senior officials and managers, and representation as professional and technical workers. The third dimension uses earned incomes of males and females (without the logarithmic transformation that is used for the HDI and GDI) to measure women's power over economic resources (Klasen 2006).

Since their introduction, researchers have articulated a number of critical shortcomings of these measures as constructed. For example, the GEM economic component is based on income levels rather than just incomes shares—a fact that conflates inequalities between men and women and the absolute level of average income in a country. Thus poor countries, even with equal representation of men and women in paid employment can never do well on this component.

Also the empirical base for data on earned income shares relies heavily on labor force participation data and gender differentials in earnings in the non-agricultural sector—both of which are highly unreliable and come from a very limited number of sectors in many developing countries (Bardhan and Klasen, 1999).

As a result of these shortcomings, there has been a proliferation of efforts in recent years to develop improved measures of women's status and the gender gap in development including the Relative Status of Women Index (RSWI) (Dijkstra and Hanmer, 2000) the Gender Equity Index (GEI) (Social Watch, 2005); the Social Institutions and Gender Equality measures (SIGI) developed by the OECD Development Centre; the Gender Inequalities Index (GII) (Ferrant, 2010), and the Global Gender Gap Index (GGI) introduced by the World Economic Forum (Haussmann, Tyson et al. 2010).

This chapter uses the Gender Gap Measure (the GGM), and index introduced by two German economists, who have attempted to improve upon some of the limitations of the UNDP's GDI (Klasen and Schuler 2010).

the standard of equality used here). This life expectancy advantage, however, is less about female advantage in life expectancy (reflecting development) than male disadvantage due to certain male associated behaviors, such as drinking, violence, accidents, and work related-stress. It would be problematic to treat countries with high male mortality as places where gender equality is particularly high or women are particularly advantaged. One partial way to address this is to cap each component at 1 before calculating the geometric mean.

I adopt this convention here, using the GGM calculated on the year 2004, capped at one. Capping rewards balanced equality in all components. Otherwise the ranking is heavily influenced by the male disadvantage in mortality in transition countries. Although somewhat counterintuitive, a high gender gap measure (i.e. close to 1) represents more equality or *less* inequality.

Gender-related norms

Acceptance of wife beating. Norms supporting wife beating are represented by the country- or site-level mean on a 5 point scale of justifications for wife beating, derived from data collected from the DHS or the WHO study.

Male dominance/control of female behavior. Norms regarding male control of female behavior are derived from aggregating at a county or site level, the percent of women who report experiencing 3 or more types of control by male partners, including such things as controlling when she may see a doctor, whether she may visit friends or relatives, etc. Data are derived from comparable questions from the DHS and WHO studies.

Ease of leaving abusive relationships

Ease of divorce. I wanted to find a measure that reflected the degree of social space for women to leave unacceptable relationships. As an approximation, I excerpted data on the overall acceptability of divorce from the World Values Survey (WVS), a global survey conducted every five years to track shifting norms and attitudes around major social issues (available at http://www.worldvaluessurvey.org). The WVS includes one question that taps the acceptability of a number of different controversial issues, such as euthanasia, prostitution, homosexuality and divorce. Specifically, the survey asks: Please tell me for each of the following actions whether you think it can always be justified, never is justified, or something in between, using a scale of 1 to 10, with 1 being, never justifiable. I used the mean value for the population as a whole as a measure of the acceptability of divorce.

Family code (minus early marriage). As a crude measure of the degree to which inequalities in family law may impede women leaving abusive relationships, I adapted a version of the Family Code sub-index of the Social Institutions and Development Index (SIGI), a composite measure of social institutions related to gender equality that was jointly developed by the University of Gottingen and the OECD Development Centre. The sub-index includes four elements:

- *Polygamy.* Measures the acceptance within a society of men having multiple wives; women in polygamous relationships are frequently prevented from pursuing a professional or academic career and are generally much younger than their husband.

- *Parental authority.* Measures whether women have the same right to be a legal guardian of a child during marriage, and whether women have custody rights over a child after divorce.
- *Inheritance.* Measures whether widows and daughters have equal rights as heirs. In many countries, inheritance is the only way in which women can obtain ownership of land, for example.
- *Early marriage.* Measures the percentage of girls between the ages of 15 and 19 who are married, divorced or widowed, providing an indication of forced or arranged marriages.

The data composing the sub-index is based on variables from the OECD Gender, Institutions and Development Database (GID-DB), which largely compiles data from various World Bank and UN sources (Branisa, Klasen et al. 2009). Because I wanted to test early marriage separately from laws and customs regulating inheritance and child custody, I acquired the original data set, and in consultation with the original sub-index authors, calculated a new sub-index without child marriage.

Culture of silence. As a crude measure on the social acceptability of disclosing partner violence, I tested the proportion of ever abused women who reported having told someone about the abuse. This measure was derived from the WHO and DHS data.

Early marriage. I hypothesized that the prevalence of early marriage would serve as a marker for settings and cultures that have highly stringent gender norms, provide few economic alternatives to women other than marriage, devalue girls, and prioritize female chastity, linking it in some settings to notions of male honour. As such, I wanted to test early marriage separately, expecting to find that high rates of early marriage would be positively associated with levels of partner violence.

Alcohol consumption and male drinking norms

To test the association between alcohol consumption patterns and population levels of partner violence, I used three measures from the WHO Information System on Alcohol and Health (GISAH). The first is a generic measure of the average amount of alcohol consumed by men, measured as the annual per capita consumption by men in liters of pure alcohol among male drinkers (including recorded and unrecorded alcohol). Regular per capita consumption rates obscure patterns of heavy drinking among those who drink. For example, while the overall per capita drinking volume in Egypt was 0.18 liters in 2005, it was 35.2 liters among males who consume alcohol (WHO Global Information System on Alcohol and Health).

The second and third measure capture heavy episodic drinking, defined as consuming six or more drinks in a single session, at least weekly. The second measure is the proportion of *all men* who qualify as heavy episodic drinkers and the third measure is the proportion of *all male drinkers* who are heavy episodic, binge drinkers.

Control variables

In cross national studies, one generally attempts to control for a limited number of factors that could potentially account for the associations observed between variables. The goal here is to eliminate competing hypotheses without "over-controlling' for factors that may be on the causal pathway between or are strongly related to the indicator of interest. Unlike individual-level analyses,

ecological studies have limited power to detect associations because of their small *n* (in the current analysis, involving only 40 countries/sites) and therefore tend to be exploratory rather than definitive.

In the case of partner violence, one factor that could distort results is the age structure of the population. Since young men are known to be more violent than older men and younger women tend to be at higher risk of current partner violence than older women, the overall population prevalence of partner violence could be affected by the proportion of the population in this high-risk age group. As a result, I age-standardized the prevalence estimates of current partner violence against a standard reference population, specifically the age-specific prevalence rates of the full WHO data base, aggregateing all 15 sites.

I also controlled for the natural log of per capita gross domestic product as measure of modernization and of economic development. How best to handle the level of economic development is a key question for this analysis given that it is both a potential explanatory variable in its own right (as a measure of modernization and/or level of economic development), and a potential confounder. Many cross national studies adjust for GDP per capita to isolate effects independent of the impact of rising affluence. The problem for my analysis is that per capita GDP (ppp) often captures a range of more subtle social changes and processes (beyond just the income effects of economic growth) that tend to accompany modernization. Because many of these factors—such as changes in gender-related norms and values—are hypothesized to relate to levels of partner violence as well as to level of modernization, including per capita GDP in regressions might well over-adjust and therefore obscure important associations. I propose to explore the associations between my explanatory variables and partner violence both independent of and adjusted for GDP per capita.

Finally, I controlled for whether the study was conducted as part of the DHS or as part of the WHO Study or other violence specific survey. Past analysis has suggested that violence specific surveys tend to yield higher rates of disclosure than studies that incorporate violence as part of a larger survey covering many other issues. Investigators have suggested that it is easier to enforce quality control and ethical guidelines in violence-focused studies than in multi-purpose surveys like the DHS. A direct comparison of partner violence rates measured in Nicaragua using the full WHO training and ethics protocol conducted on the same sampling frame as the DHS achieved significantly higher rates of disclosure than that measured in the DHS (52% versus 28% for lifetime physical violence) (Ellsberg, Heise et al. 2001).

Missing values

Given the small number of countries that have national estimates of current partner violence available for analysis, it is critical that countries do not fall from the analysis due to the absence of one or more covariates. Consequently, I imputed the missing values using the user-written *mice* command in Stata that uses chained equations to generate missing values and appropriate standard errors (Royston 2009). Mice with chained equations is appropriate for data whose pattern of missing is non-monotonic, as is the case for the ecological data set used in this analysis (White, Royston et al. 2011).

Since many of the covariate data sets were skewed with significant kurtosis, I transformed the non-normal variables with missing values using either a log or square root transformation. While this manipulation helped address the departures from normality, q-plots and the Shapiro Wilks tests for normality indicated that some variables remained slightly biased at the tails.

For each individual variable with missing values, I developed a separate regression equation including all variables that significantly predicted its presence and/or predicted missingness for that variable and used these equations and the mice command to impute missing values. Given the small sample size of the data set, I allowed the program to cycle through the imputation sequence 100 times (m=100) (White, Royston et al. 2011).

Once the data were imputed, I reconverted the variables back to their non-transformed form in order to facilitate later interpretation.

8.3 Statistical Analysis

I used scatterplots, histograms, and quantile regression to assess normality, identify outliers, and examine the potential associations between explanatory variables and levels of partner violence at a country and site level.

Because there were a handful of countries with extremely high rates of current partner violence (including the Democratic Republic of the Congo, Zambia and Uganda) and one (Germany) with disproportionately low levels of current partner violence, I chose to use quantile rather than linear regression to model the associations among variables. Quantile regression is less affected by outliers because it models the median rather than the mean as its measure of central tendency (Hao and Naiman 2007). Quantile regression estimates allow the explanatory variables (X) to exert changes on the central tendency, variance, and shape of the outcome variable (y) distribution (Koenker and Hallock 2001). Mathematically, it replaces least-squares estimation with least-absolute distance estimation, a technique that is more forgiving in terms of underlying assumptions. Compared to linear regression, quantile regression generally yields more accurate coefficients for skewed data sets, with fewer covariates emerging as significant. Quantile regression also allows the user to explore any quantile of the response variable distribution, making it especially useful for examining whether a covariate exerts a differential effect at low versus high ends of an outcome distribution (Hao and Naiman 2007). For this analysis, I report estimates of effect for the bottom quintile (0.20), median (0.50) and top quintile (0.80) of the partner violence distribution.

My strategy for model building was first to explore how each set of variables chosen to represent a specific domain (e.g. women's status, gender inequality, ease of leaving abusive relationships) interacts with other variables in that set. How does controlling for one influence the strength and statistical significance of the others in that domain? Which maintain a strong and significant association with the outcome when adjusted by the others? Which remain significant when controlled for level of economic development (natural log of GDP per capital)?

Once I had identified the variable(s) from each domain that best captured the hypothesized construct, I began building a multi-variable model, beginning with the constructs closest to the outcome—in this case, norms that might encourage violence—and then adding variables

representing more distal concepts, such as women's access to wage employment (women's status), and inequality in family law (gender inequality). Finally, I added the natural log of GDP per capita as a measure of a country's overall level of economic development. I conceptualized this variable as the most expansive yet distant construct that could affect the geographic distribution of partner violence.

Because of the small number of studies available for analysis, I used p=0.10 as the cutoff for maintaining factors for consideration in model building. All analysis was conducted using STATA 11 (Stata Corporation, College Station Texas, 2010).

8.4 Findings

8.4.1 Description of variables

Table 8.2 summarizes descriptive statistics of the explanatory variables used in the analysis. The table illustrates the wide range of realities captured among the countries represented in the study. These include extremely poor countries with a mean per capita GDP of $199 (2008 US$) up to wealthy countries with a mean GDP per capita of almost $33,000. Likewise, the percent of women involved in the formal labor force varies from 4% to 91% and the percent of parliamentarians that are women ranges from 2% and 49%.

Table 8.2 Descriptive Statistics (prior to imputation for missing data)

Indicator			Urban sites					Rural sites			
	N	Median	Mean	Std Deviation	Min	Max	Median	Mean	Std Deviation	Min	Max
Level of modernization/development											
GDP--PPP	41	3026	5621	(7567)	199	32,967	2576	4773	(6562)	199	32,967
Women's status/level of empowerment											
Percent of 20 to 24 year olds married before 18	40	23.1	26.1	(16.5)	0.9	68.7	24.2	28.4	(16.1)	1.2	68.7
Percent of women 15 to 49 who have completed secondary school	41	38.4	39.9	(26.2)	3.6	99.6	13.3	18.5	(22.9)	0.3	99.8
Percent using modern method of contraception	41	42.4	41.6	(18.3)	9.5	78.9	33.6	33.9	(20.4)	3.3	78.9
Women's economic rights and waged employment											
CIRI Women's Economic Rights	41	1.0	1.12	(0.71)	0	3	1.0	1.1	(0.70)	0	3.0
Female share of non-agricultural employment	37	35.3	34.2	(11.3)	11.4	55	31.9	33.7	(11.5)	11.4	55.0
Percent of women engaged in formal waged employment	29	42.9	42.0	(27)	4.0	91.2		39.0	(25.9)	4.0	91.2
Women's political rights and representation											
Percent of parliamentary seats held by women	41	12.0	15.6	(9.9)	2	49	11.5	15.5	(10.0)	2.0	49.0
Women's Political Rights	41	2.0	2.05	(0.38)	1	3	2.0	39	(2.0)	1.0	3.0
Level of gender inequality											
GGM Gender Gap Measure (high=more equality)	37	0.86	0.83	(0.09)	0.659	0.944	0.86	0.83	(0.09)	0.659	0.944
Ratio of females to males enrolled in tertiary education	38	84	89.5	(44.1)	0.46	240	77	87.5	(45.3)	0.46	240.0
Ratio of married women completing secondary/married men completing secondary	40	0.82	0.82	(0.47)	0.27	2.67	0.57	0.79	(0.88)	0.07	4.3
Family law index (gender inequalities in marriage rights , child custody or inheritance	41	0.5	0.94	(0.94)	0	3	0.75	0.99	(0.94)	0	3.0
Ownership inequalities	36	0.35	0.31	(0.29)	0	0.84	0.52	0.33	(0.30)	0	0.84

Gender related norms											
Acceptability of wife beating (mean score)	38	0.67	0.74	(0.65)	0.024	3	1.3	1.3	(0.81)	0.01	3.2
Male control of female behaviour (% experiencing at least three)	36	19.2	19.8	(11.55)	2.9	48.8	18.4	18.6	(9.6)	3.8	39.2
Ease of leaving abusive relationships											
Mean level of population acceptance of divorce (World Values Survey)	38	4.0	4.0	(1.4)	1.5	6.7	3.8	3.9	(1.4)	1.5	6.7
Percent of abused women who had told someone about the abuse	28	21.9	25.3	(12.9)	5.6	61.5	22.4	25.6	(14.8)	9.0	65.4
Alcohol and drinking norms											
Per capital alcohol consumption among male drinkers	40	15.4	19.3	(12.6)	0.7	43.1	17.2	19.3	(12.5)	0.7	43.1
Percent of male drinkers who binge drink	23	12.2	11.1	(6.7)	0.5	21.8	11.2	10.7	(6.7)	0.5	21.8
Percent of male drinkers who are heavy drinkers	23	25.0	24	(13.2)	7	51.6	26.0	24.3	(13.5)	7.0	51.6
Other male factors											
Percent of partner's unemployed (of currently partnered women)	41	1.9	3.8	(4.15)	0	12.8	1.5	3.6	(4.9)	0	18.7
Percent of male partners of women 15 to 49 who have completed secondary school	41	44.9	46	(24.34)	10.1	99.1	15.1	21.9	(22.9)	0.9	99.5

8.4.2 Bi-variable associations

Table 8.3 summarizes the bi-variable associations between the hypothesized covariates and the population level of current physical and/or sexual violence by an intimate partner, broken down by urban, rural, and national samples. It presents the level of effect associated with current partner violence assuming a distribution of countries centered on the lowest quintile (0.20), the median (0.50) and the highest quintile of current partner violence (0.80). Statistically significant results are colored green at the 0.20 quintile, blue at the 0.50 quintile, and lavender at the 0.80 quintile.

At the macro level, as predicted, the prevalence of partner violence centered at the median is negatively associated with rising GDP, suggesting that as countries modernize the rate of partner violence declines. Partner violence prevalence is also negatively associated with a range of women's *status variables*, including: the proportion of women completing secondary education and the percentage of women participating in the formal salaried labor force. It is also negatively associated with the CIRI index of women's economic rights, a proxy for the degree to which women have successfully claimed their rights in law. Collectively, these associations suggest that as women become more socially and economically empowered, the overall rate of partner violence goes down.

The population prevalence of current partner violence also appears linked to the degree of gender inequality present in a society. At the bi-variable level, partner violence levels are negatively associated with the ratio of women to men enrolled in tertiary education, the ratio of women to men completing secondary education, the share of non-agricultural wage labor occupied by women, and inequalities in women's access to land, credit and non-moveable property (the ownership inequality index). Thus, where gender inequality is more pronounced, so too are rates of current partner violence.

By contrast, the level of inequality in family law related to marriage, child custody and inheritance appear positively associated with the level of partner violence, as does the level of early marriage. In both cases, societies that countenance child marriage or that have family laws that discriminate against women tend to have higher population levels of partner violence. Partner violence is also more common where a greater proportion of men and women approve of wife beating, where male control of female behavior is normative, and where people are less accepting of divorce. Although rates of violence appear lower in settings where individuals are more tolerant of divorce in all three samples, the association does not reach significance in the national-level samples, probably due to small sample size.

Interestingly, the impact of different predictor variables varies considerably along the distribution of country-level estimates of current partner violence. The quantile regression parameter estimates the change in a specified quantile of the outcome variable produced by a one unit change in the predictor variable, holding all other covariates constant. This allows comparing how some percentiles of country-level current partner violence may be more affected by certain covariates than other percentiles (Despa 2007).

With a handful of exceptions, the effect size of each covariate is larger at the 0.80 tail of the current violence distribution than at the 0.20 tail, with the effect size at the median somewhere in between. This suggests that predictor variables tend to have a greater impact on the level of partner violence

at the high end of the current violence continuum (0.80 quintile) than at the lower end. Nonetheless, in all cases, the associations are consistently in the hypothesized direction, although not all reach statistical significance.

For example, a one unit change in the level of early marriage increases current partner violence by 0.66 at the 80th quantile of the current violence distribution but by only 0.20 at the lowest quintile. The only variables that break from this pattern are the share of women in nonagricultural labor the relative proportion of women versus male partners who complete secondary school (where higher inequality seems to have a greater effect on levels of partner violence in countries at the low end of the violence distribution (0.20 quantile) than at the upper quantile. In the former case, the share of women (versus men) in nonagricultural labor has virtually the same effect on levels of partner violence across the entire partner violence distribution.

An additional set of variables appear *not* to be significantly associated with levels of partner violence at a population level. These include the proportion of women who report using a modern form of contraception, the proportion of abused women who have told someone about the abuse, and both measures of women's political participation and rights, including the CIRI political rights measure (Wopol) and the percent of parliamentary seats held by women. The association between current partner violence and women's political rights and representation reaches significance only among those countries in the lowest quantile of the current partner violence distribution (.20).

Contrary to expectation, there was also no association between levels of partner violence and any of the three measures of country-level alcohol consumption, including per capita alcohol consumption among men who drink, the proportion of adult men who engage in heavy episodic drinking, and the proportion of *all male drinkers* who are binge drinkers.

Whether or not the data on partner violence were collected as part of a DHS or WHO study had little consistent effect on the estimate of current partner violence across the full distribution of partner violence estimates. Among countries in the lowest quintile, having DHS as the implementing agency modestly and significantly increased the level of partner violence, whereas at the conditional median, the impact of data source on the country-level estimate of violence was negative and nonsignificant.

Table 8.3 Bi-variable associations between 12 month partner violence and various macro-level factors, for urban, rural and national samples

Indicator	Urban coefficient (*p*-value) N=40			Rural coefficient (*p*-value) N=38			National coefficient (*p*-value) N=31		
Macro-level variables	.20	.50	.80	.20	.50	.80	.20	.50	.80
GDP--PPP (natural log)	-3.4 (≤0.001)	-5.5 (0.007)	-8.5 (0.012)	-4.6 (≤0.001)	-6.7 (0.002)	-9.3 (0.006)	-4.2 (≤0.001)	-5.1 (0.07)	-9.3 (0.05)
Women's status/level of empowerment	.20	.50	.80	.20	.50	.80	.20	.50	.80
Proportion of women completing secondary school	-0.15 (0.001)	-0.22 (≤0.001)	-0.31 (0.06)	-0.17 (0.02)	-0.26 (0.003)	-0.29 (0.08)	-0.16 (0.06)	-0.25 (0.008)	-0.39 (0.12)
Proportion of 20 to 24 year olds married before 18	0.20 (0.008)	0.25 (0.07)	0.66 (0.04)	0.24 (0.03)	0.28 (0.05)	0.73 (0.001)	0.23 (0.12)	0.26 (0.18)	0.77 (0.05)
Proportion using modern method of contraception	-0.00 (0.98)	-0.33 (0.74)	-0.25 (0.57)	-0.14 (0.19)	-0.17 (0.20)	-0.34 (0.21)	-0.14 (0.31)	-0.15 (0.31)	-0.25 (0.51)
Women's economic rights and access to wage employment	.20	.50	.80	.20	.50	.80	.20	.50	.80
Women's economic rights and entitlements (0 to 3; 3 equals more rights recognized and enforced)	-4 (0.009)	-7.25 (0.044)	-12.1 (0.016)	-4.8 (0.024)	-5.3 (0.281)	-5.7 (0.45)	-3.9 (0.003)	-5.9 (0.230)	-9.9 (0.269)
Women work for cash	-0.13 (0.28)	-.08 (0.618)	-0.13 (0.67)	0.04 (0.78)	0.11 (0.44)	0.27 (0.41)	0.004 (0.98)	0.02 (0.91)	0.40 (0.15)
Women's access to waged employment	-0.17 (0.04)	-0.27 (≤0.001)	-0.37 (0.01)	-0.19 (0.06)	-0.25 (0.01)	-0.35 (0.05)	-0.16 (0.05)	-0.24 (≤0.001)	-0.42 (0.05)
Women's political rights and representation	.20	.50	.80	.20	.50	.80	.20	.50	.80
Women's de jure political rights	-5.8 (0.02)	-1 (0.83)	-7.9 (0.37)	-10 (≤0.001)	-5.7 (0.44)	-12.6 (0.13)	-8.1 (≤0.001)	-1.4 (0.83)	-11 (0.37)
Women's political representation	-0.12 (0.60)	-.04 (0.80)	0.15 (0.78)	-0.38 (0.06)	-0.13 (0.65)	-0.15 (0.78)	-0.34 (0.11)	-0.01 (0.96)	0.26 (0.75)
Gender inequality	.20	.50	.80	.20	.50	.80	.20	.50	.80
Ratio of females to male partners completing secondary school	-16 (≤0.001)	-4.8 (0.09)	-9.8 (0.71)	-6.2 (0.001)	-3.9 (0.15)	-0.74 (0.88)	-9.2 (0.002)	-6.0 (0.08)	-0.69 (0.95)
Relative female to male enrollment in tertiary education	-0.10 (0.09)	-0.12 (0.03)	-0.25 (0.07)	-0.13 (0.08)	-0.17 (0.03)	-0.22 (0.10)	-0.11 (0.10)	-0.17 (0.04)	-0.23 (0.34)

Relative female to male access to waged employment	-0.40 (0.002)	-.30 (0.14)	-0.44 (0.351)	-0.38 (0.025)	-0.36 (0.12)	-0.23 (0.68)	-0.35 (0.05)	-0.36 (0.07)	-0.36 (0.59)
Women's ownership index (1=high inequality; 0 = low inequality)	15.2 (0.001)	22.8 (0.003)	32.0 (0.11)	19.5 (0.004)	25..9 (0.002)	22.3 (0.24)	15.6 (0.002)	24.2 (0.014)	32.7 (0.128)
Gender gap in achievement of development goals	-39.0 (0.03)	-38.3 (0.22)	-89.3 (0.05)	-43 (0.11)	-35.8 (0.33)	-58 (0.21)	-28 (0.18)	-34.8 (0.27)	-71.2 (0.31)
Norms and beliefs	.20	.50	.80	.20	.50	.80	.20	.50	.80
Acceptability of wife beating (Mean of % agreeing with at least one reason)	10.1 (0.001)	11.4 (0.001)	17.9 (0.007)	7.3 (0.08)	10.1 (≤0.001)	15.6 (≤0.001)	7.0 (0.06)	10.0 (0.002)	13.9 (0.09)
Male dominance/control of female behavior (>3 on control scale)	0.46 (≤0.001)	0.70 (≤0.001)	0.67 (0.12)	0.59 (0.007)	0.71 (0.03)	0.47 (0.50)	0.56 (0.006)	0.73 (0.007)	0.77 (0.27)
Ease of leaving abusive relationships	.20	.50	.80	.20	.50	.80	.20	.50	.80
Disclosed violence	-.02 (0.90)	-0.15 (0.35)	-0.25 (0.60)	-0.03 (0.85)	-0.14 (0.50)	-0.17 (0.68)	-0.12 (0.57)	-0.20 (0.33)	-0.38 (0.51)
Acceptability of divorce	-2.6 (0.02)	-3.8 (0.003)	-4.5 (0.40)	-3.0 (0.05)	-3.7 (0.11)	-1.9 (0.61)	-2.7 (0.12)	-2.1 (0.37)	-1.8 (0.77)
Presence of discriminatory laws and practice related to child custody, marital separation, or inheritance	5.9 (≤0.001)	6.4 (0.008)	6.2 (0.14)	7.8 (≤0.001)	6.7 (0.02)	4.4 (0.49)	6.9 (0.01)	6.4 (0.09)	7.0 (0.56)
Alcohol use and drinking norms	.20	.50	.80	.20	.50	.80	.20	.50	.80
Amount of alcohol consumed annually per male drinker	0.08 (0.68)	0.09 0.61	-0.04 (0.89)	-.17 (0.37)	0.22 (0.37)	0.06 (0.90)	0.11 (0.64)	0.05 (0.83)	0.14 (0.88)
Percent of adult men who are binge drinkers (> 6 drinks per session)	-0.16 (0.53)	-0.19 (0.45)	-0.06 (0.93)	-0.09 (0.76)	0.03 (0.92)	0.07 (0.90)	-0.07 (0.83)	0.10 (0.75)	0.36 (0.67)
Percent of all men who drink who are binge drinkers	0.10 (0.43)	0.10 (0.50)	0.23 (0.62)	0.15 (0.27)	0.18 (0.27)	0.14 (0.71)	0.15 (0.30)	0.20 (0.26)	0.39 (0.48)
Control variable	.20	.50	.80	.20	.50	.80	.20	.50	.80
Source of data: DHS vs. non DHS (e.g. WHO Study)	6.9 (0.004)	-0.6 (0.87)	8.9 (0.41)	5.7 (0.16)	-4.3 (0.42)	0.4 (0.98)	8.3 (0.002)	1.0 (0.90)	8.2 (0.60)

8.4.3 Scatterplots of bi-variable associations

Another way to explore the strength and consistency of correlation between various macro-level indicators and distribution of partner violence is to visualize the association using scatterplots. On the adjoining pages, I reproduce graphics that depict the association among some of the key covariates. You will note that the Republic of the Congo (coded as ZAR) is a strong and consistent outlier in most of the graphs, with much higher rates of partner violence than other countries with similar standing on each of the covariates. This may represent the added impact of the ongoing violent conflict in this country on the current prevalence of partner violence. A key linking abbreviations to their countries is available at the end of the chapter.

Similarly, Zambia (ZMB) and Uganda (UGA) appear to have consistently higher rates of partner violence than countries similarly ranked on the covariate under exploration, whereas Cambodia (KHR), Honduras (HND) and the Maldives (MAL) appear to have markedly lower rates of partner violence than one might expect given their value on the covariates tested. I explore what lessons we might productively learn from studying these "deviant cases" more thoroughly in the discussion.

Figure 8.1 Association between percent of women completing secondary school and the 12 month prevalence of partner violence among national–level samples

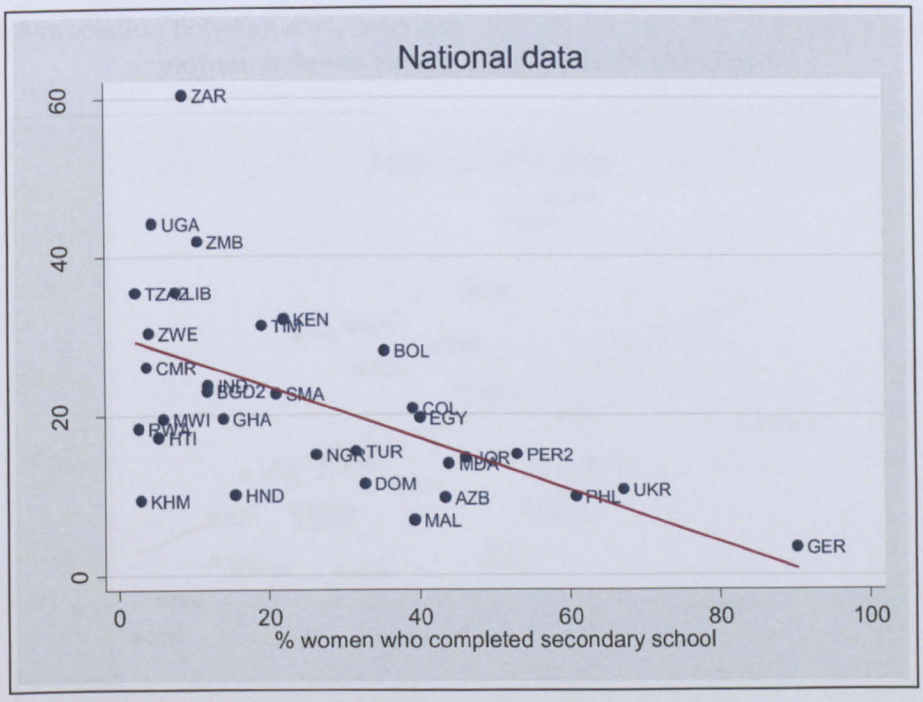


Figure 8.2 Association between level of eonomic development (natural log of GDP, ppp) and population prevalence of current partner violence

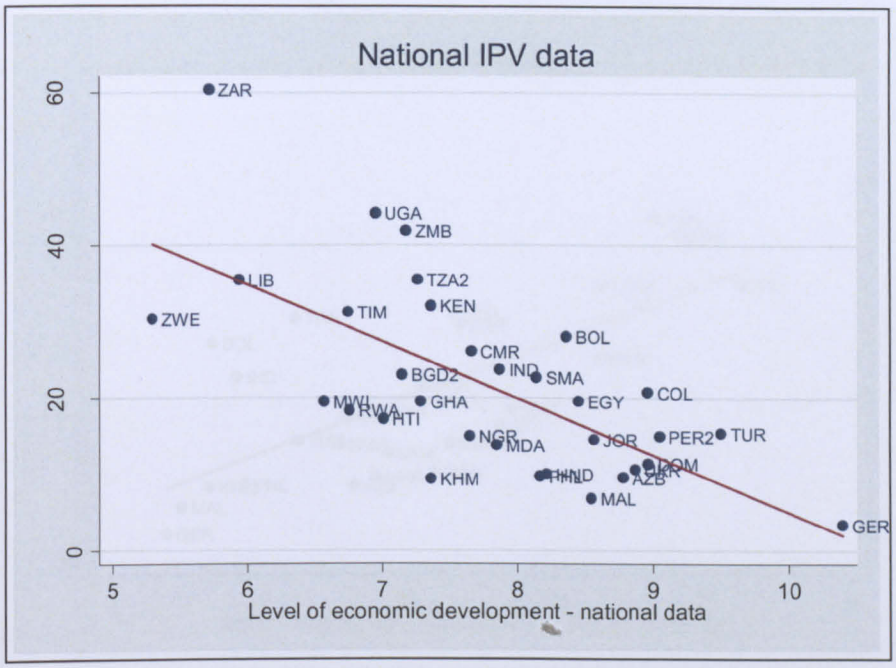


Figure 8.3 Association between early marriage (beflore 18) and the 12 month prevalence of partner violence among national–level samples

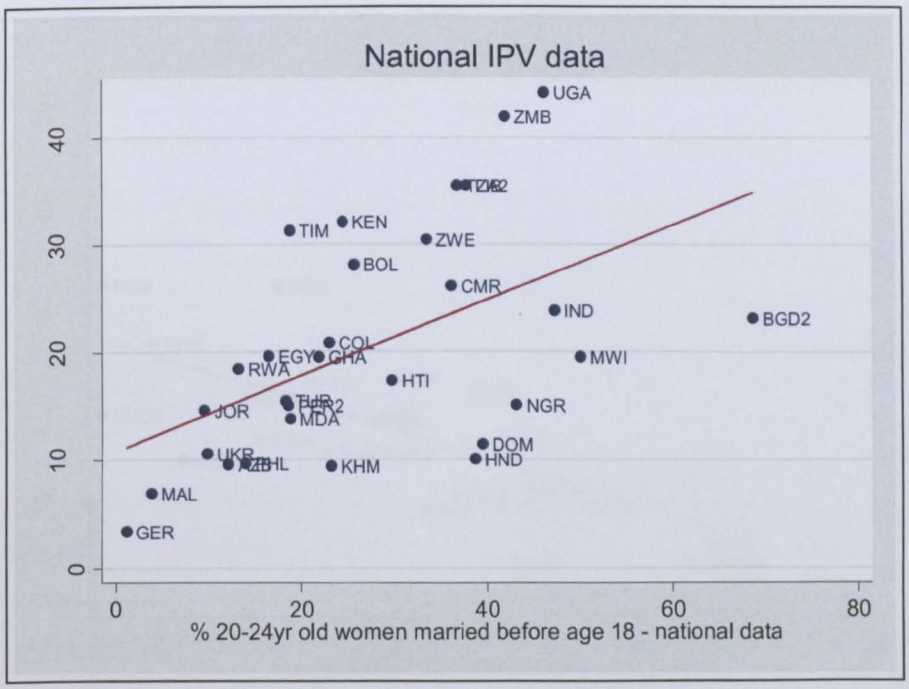


Figure 8.4 Association between prevalence of high male control over female behavior and the 12 month prevalence of partner violence among national–level samples

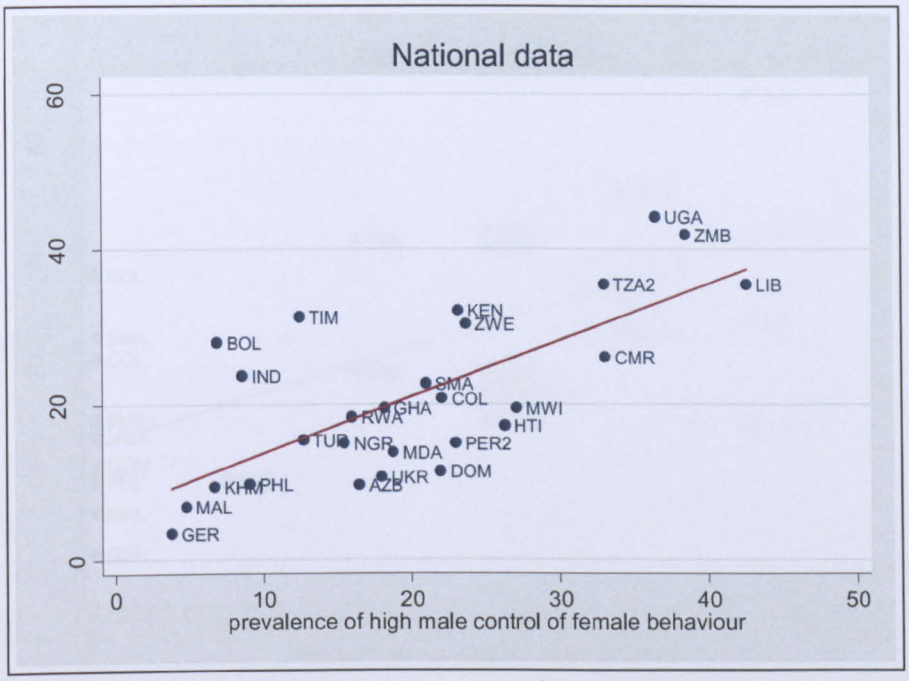


Figure 8.5 Association between acceptability of divorce and 12-month population prevalence of partner violence among urban samples

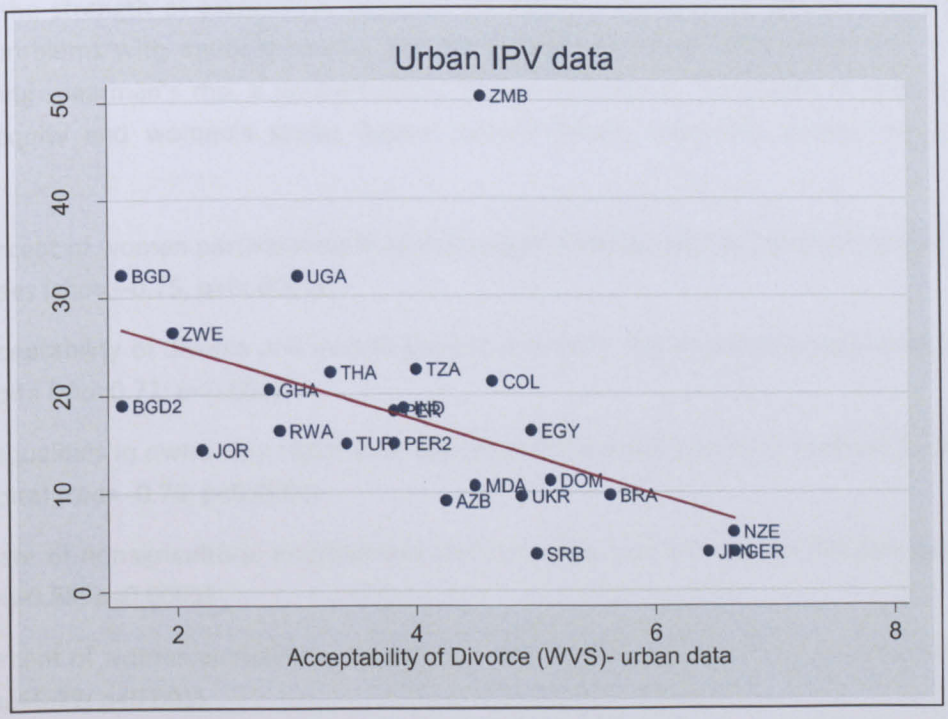
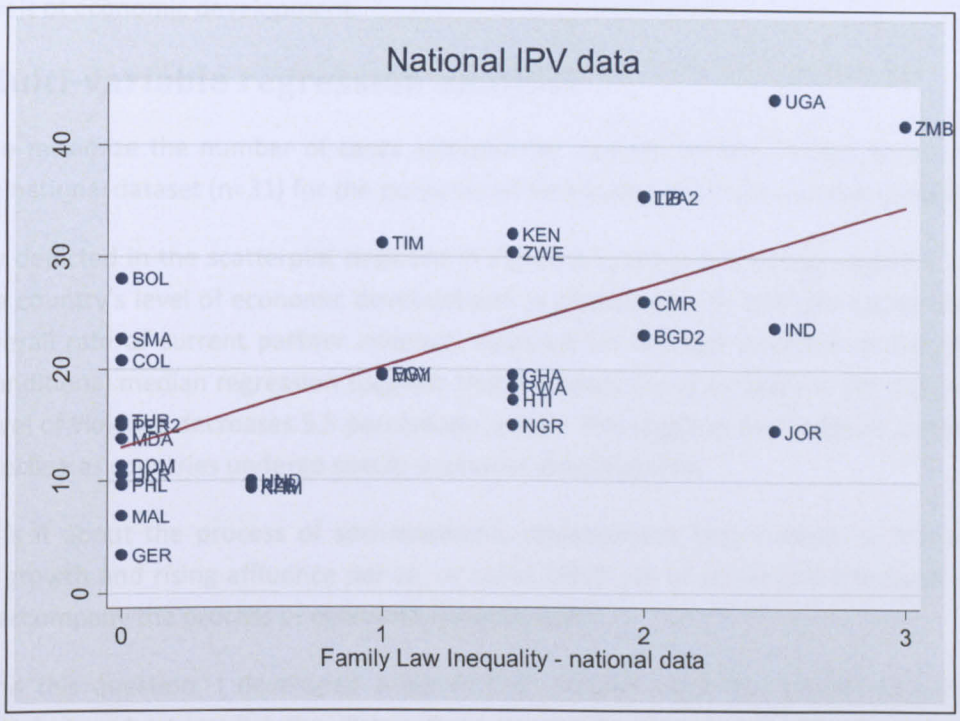


Figure 8.6 Association between level of inequality in family law and the 12-month population prevalence of partner violence, national samples



8.4.4 Correlations between explanatory variables

In addition to examining correlations between macro factors and current partner violence, I also looked at the strength of association between the various explanatory factors, looking both for potential problems with multicollinearity and for insights into how different factors might inter-relate. Using spearman's rho, a nonparametric test of association, a number of variables tapping gender inequity and women's status appear closely linked, especially among urban samples, including:

- Percent of women participating in formal waged employment and discriminatory family law codes (*rho*= --0.75, p=(<.0001);
- Acceptability of divorce and overall level of economic development (natural log of GDP per capita (*rho*=0.72; p<0.001)
- Inequalities in ownership rights and level of economic development (natural log of GDP per capita) (*rho*= -0.76; p<0.0001)
- Share of nonagricultural employment performed by women and the Gender Gap Measure (*rho*-0.88; p<0.0001)
- Percent of women completing secondary school and overall level of economic development (*rho*=0.77; p<0.001)
- Proportion of women in formal salaried employment and level of economic development (*rho*=0.82; p<0.0001)

These findings indicate that many of the potential explanatory variables are highly correlated, and that many designed to capture women's status and gender inequity, are highly correlated with overall levels of economic development.

8.4.5 Multi-variable regression analysis

In order to maximize the number of cases available for analysis (n=40), I chose to use the urban versus the national dataset (n=31) for the purposes of developing the multi-variable model.

As visually depicted in the scatterplot depicted in Figure 8.2, there is a strong negative association between a country's level of economic development as captured by its GDP per capita (natural log) and its overall rate of current partner violence, adjusted for the age structure of the population. Indeed, conditional median regression suggests that for every 1 unit increase in per capita GDP, the median level of violence decreases 5.5 percentage points. This suggests that rates of current partner violence decline as countries undergo soecio-economic development.

But what is it about the process of socioeconomic development that is key? Is it the effect of economic growth and rising affluence *per se,* or some other set of social and structural shifts that generally accompany the process of economic development?

To examine this question, I developed a conditional median regression model to explore what macro-level factors best predict the distribution of current partner violence across countries. I entered factors according to their hypothesized distance from the outcome of interest (current partner violence), beginning with social norms regarding the acceptability of wife beating and male control of female behavior and expanding outwards to factors hypothesized to operate more distally. The natural log of gdp per capita was added last to see whether it continued to exert a strong influence on levels of partner violence after more proximate variables had been considered.

As illustrated in Table 8.4, both norms around the acceptance of wife beating and male control of female behavior are strongly and significantly associated with the distribution of current partner violence across settings. When put into the model together, both constructs remain independently significant, although some modest confounding appears present as indicated by small reductions in their respective coefficients.

Separate exploration of the variables chosen to represent women's status and women's economic and political power, demonstrate that of the variables that remained significant at the 0.1 level in bi-variable analysis, women's access to formal wage employment best captured the related constructs of women's status and economic power. While the proportion of women completing secondary school was a more robust predictor of median current partner violence than level of early marriage, when considered together, women's level of formal wage employment largely absorbed the impact of women's secondary school completion.

Among the variables selected to represent gender inequality, inequality in women's ownership rights (access to land, property and credit) and women's enrollment in tertiary education compared to men's, emerged as most predictive of median levels of current partner violence. When considered together in the same model, the coefficient of ownership rights reduces from 22.8

(p=0.003) to 14 (p=0.15) and female to male ratio of tertiary enrollment shifts from -0.22 (p=0.03) to -0.09 (p=0.24), suggesting that these variables are highly confounded or tap overlapping constructs.

Finally, among the items chosen to represent ease of leaving abusive partnerships, the acceptability of divorce as measured by the World Values Survey and inequality in family law were the strongest predictors of current partner violence levels, although neither of these remained significant when considered together with women's formal waged employment or women's ownership rights [not shown]. Indeed, even when considered separately from the more proximate norm-related variables, none of the other variables maintained a strong influence on the level of partner violence once wage labor and/or ownership rights were considered, suggesting that these two factors best operationalized the concepts of women's power and gender inequality.

When natural log of per capita GDP is ultimately added to the model, it does little to attenuate the effects of either the norm-related variables or the women's power and gender inequality variables (see models 4 and 5), but its own impact on the level of current partner violence dramatically declines and becomes no longer statistically significant.

Table 8.4 Multiple regression analysis predicting prevalence of current partner violence in 40 population based surveys of partner violence, urban areas

	Age-adjusted crude coef.	Model 1	Model 2	Model 3	Model 4	Model 5
Gender norms	B (p value)	B (p value)	B (p value)	B (p value)	B (p value)	B (p value)
Acceptability of wife beating	11.4 (0.001)	8.0 (0.002)	6.7 (0.004)	6.8 (0.002)	6.7 (0.006)	6.7 (0.008)
Male entitlement norms (male control of female behavior)	0.70 (≤0.001)	0.50 (0.002)	0.40 (0.01)	0.40 (0.007)	0.37 (0.028)	0.38 (0.028)
Women's status and economic power						
Percent women in formal salaried employment	-0.27 (0.001)		-0.07 (0.33)			-0.06 (0.61)
Gender inequality						
Women's ownership index (1=high inequality; 0 = low inequality)	22.8 (0.003)			10.0 (0.11)	8.8 (0.25)	
Level of Development						
GDP per capita (nat log)	-5.5 (0.007)				-0.45 (0.81)	-0.34 (0.89)
Constant	----	2.5 (0.33)	8.4 (0.17)		6.9 (0.7)	10.7 (0.58)
Number of samples	40	40	40	40	40	40

8.5 Discussion

This study demonstrates a clear link between population levels of partner violence and a range of key gender- and economic-related covariates, including: level of socioeconomic development, frequency of early marriage, proportion of women who complete secondary education, and women's access to formal waged employment. It also confirms a link between the geographic distribution of partner violence and various measures of gender inequality, including women's access to post-secondary education relative to men's, women's relative access to waged employment, and gender inequality in women's access to land, property and credit. Finally, it confirms that rates of partner violence are lower in settings that are more accepting of divorce and exhibit less discrimination against women in laws related to inheritance, marriage, and child custody.

Although fundamentally exploratory in nature, this analysis—together with that of Archer (Archer 2006), Kaya and Cook (Kaya and Cook 2010), and the other authors whose studies I review in Table

2.1—suggest a number of important findings relevant to understanding the population distribution of intimate partner violence.

First current partner violence appears strongly related to a country's overall level of economic development, as proxied by the natural log of GDP per capita. In both my analysis and the cross national studies of Kaya and Cook, and Palma-Solis and colleagues, as well as the state-level analysis of Ackerson and Subramanian in India, levels of partner violence appear to decrease with increasing per capita GDP across urban, rural and national samples (Ackerson, Kawachi et al. 2008; Palma--Solis, Vives-Cases et al. 2008; Kaya and Cook 2010). This suggests that through some combination of processes that of accompany economic development, societies tend to converge over time toward lower rates of intimate partner violence. This could be due to the emergence of more gender equitable norms as values shift from survival issues to greater emphasis on self actualization, individualism and innovation, as modernization theorists contend (Inglehart, Norris et al. 2002). Or it could be due to the shifts in women's individual and collective power as gender stratification in jobs and political power begin to dissolve in the face of women's emancipatory demands and widespread entry into the paid labor force (Seguino 2007). The high correlations between women's participation in the formal wage economy, the proportion of women completing secondary education, and women's equal access to property, credit and land, suggest that increased economic and educational opportunities are likely to be one of the mechanisms through which modernization and development affect the prevalence of partner violence.

Second, partner violence is more prevalent in societies characterized by high gender inequality and ideologies of male dominance. Although studies that have attempted to link partner violence to gender ideologies of male dominance and female subordination within wealthy countries have found only moderate support for this thesis (Yllo and Straus 1984) (Smith 1990); (Straus 1994), their failures has likely been a function of the relative lack of variation in these key gender variables (such as approval of wife beating) in high-income countries.

In the present analysis, of all the variables tested, the strongest and most consistent associations were between current partner violence and norms that approve of wife beating and that grant men authority to control female behavior. This relationship remains strong and significant even after adjusting for a country's level of economic development and more distal measures of women's status, such as their economic power, and the level of gender inequality in access to rights and resources. This suggests that collective beliefs and norms are among the key proximal drivers of the different levels of partner violence between settings. The findings from Chapter 7 of this thesis suggest that in addition to driving national level trends in partner violence, similar dynamics operate to shape relative rates of partner violence between and among neighborhoods.

The chapter similarly reports strong links between level of current partner violence and various indicators of gender inequality, most notably inequality in access to higher education (female to male ratio of enrollment in tertiary education), and inequality in ownership rights. These findings are consistent with a recent multilevel analysis of the Indian National Family Health Survey that similarly found a strong association between an index of gender inequality and the average level of partner violence reported by women in different Indian states (Ackerson, Kawachi et al. 2008). This state-level variation persisted even after controls for individual and community level factors known

to affect partner violence risk. Together these data suggest that ideologies, norms and institutional structures that justify and reproduce inequalities between men and women partly account for the vastly higher levels of partner violence observed in many developing-world settings.

Third, national variations in prevalence of partner violence appear linked to macro-level factors affecting women's economic power and rights. My analysis found that rates of partner violence were consistently lower in countries where more women participated in the formal wage economy and where laws and practices facilitated women's entry into the labor force, including protecting their right to work without their husband or father's approval, passing and enforcing laws against sexual harassment and discrimination in the workplace, and ensuring job security through such mechanisms as maternity leave. It also demonstrated a consistent link with women's de facto and de jure ownership rights related to property and credit. In their analysis, Kaya and Cook found that levels of partner violence were negatively associated with women's share of nonagricultural employment (Kaya and Cook 2010). Our data found a similar association in crude analysis adjusted for the age-structure of the population, but gender inequality in ownership rights and women's participation in the formal wage economy emerged as better predictors of the geographic distribution of partner violence across settings.

Crosscultural analysis of wife beating in traditional small-scale societies also emphasizes the importance of women's economic power relative to that of men, especially within the household. Using data from a global data base of anthropological field data (known as the Human Area Relations Files) Levinson examined factors that correlated with the relative prevalence of wife beating among 70 small scale societies. Although studying less complex societies, his analysis nonetheless also found that economic inequalities between men and women was one of the strongest predictors of the presence of wife beating in a society (Levinson 1989). A similar analysis by Erchak of a slightly different subset of societies found a strong and significant association between wife beating and general cultural beliefs in the inferiority of women (tau^b=-0.24; p=.014) (Erchak and Rosenfeld 1994). Again, the fundamental insight from my analysis seems to mirror that found in ethnographic studies of small-scale societies.

This chapter's findings similarly add to the small but growing body of evidence that links the prevalence of partner violence with laws and norms affecting women's ability to leave unsatisfactory or violent relationships. I found, for example, a consistent association between gender-related inequalities in a country's family code and that country's level of partner violence. Where women are discriminated against in terms of inheritance law, where they have unequal access with men to divorce or they risk losing custody of their children if a marriage dissolves, the rate of partner violence is higher. Levinson found a similar pattern in his quantitative study of traditional societies in the Human Area Relations Files (Levinson 1989).

I also found a negative association between ease of divorce (proxied by judgmental attitudes toward divorce as indicated by the World Values Survey) and rates of wife abuse. This evidence is consistent with far stronger data emerging from analysis of a natural experiment that tracked the impact of the easing of divorce restrictions in the United States between 1976 and 1985. During this period, states gradually adopted laws allowing either spouse to unilaterally initiate divorce without the consent of their partner. Examining state panel data on female suicide, homicide and domestic violence,

researchers found an 8% to 16% decline in female suicide, a 10% decline in women murdered by intimates, and a 30% decline in severe domestic violence in states that adopted unilateral divorce laws (Stevenson and Wolfers 2003). They found no parallel affects of unilateral divorce on state levels of male suicide or spousal homicide of men. The authors conclude that "The effect on domestic violence was large enough to imply that domestic violence was reduced not just by ending violent relationships, but by reducing the violence in extant relationships as well (p269)." They speculate that the introduction of unilateral divorce strengthened women's bargaining position in marriage by adding credibility to the possibility that they would leave abusive men (Stevenson and Wolfers 2003).

Contrary to my expectations, the level of formal and informal alcohol consumed per male drinker or the prevalence of binge drinking was not related to the population level of intimate partner violence. The sample did include a number of Muslim countries that had quite low rates of per capita consumption, including Egypt (0.32 liters per capita), Jordan (0.65 liters per capita), Mali (.99 liters per capita) and Samoa (4.5 liters per capita), With 13.34 liters per capita, Azerbaijan was an outlier among Muslim countries. These rates compared to 11.46 liters per capita in Namibia, 14.92 liters per capita in Ireland and 12.7 liters per capita in Nigeria. Despite this range, there was no clear association between per capita consumption among men who drink, or between the level of binge drinking by men and overall levels of partner violence in the last 12 months. This suggests that while women's individual risk of being beaten is strongly influenced by having a partner who is frequently drunk (as demonstrated in Chapter 6), the level of alcohol use and binge drinking does not work at a macro level to define the geographic distribution of current partner violence. The ecological analysis in Chapter 7 did find that the average frequency of male drunkenness at a cluster level affected the mean level of partner violence in that neighborhood (cluster), but the effect does not appear to extend to the level of country. This illustrates that factors that account for individual- or neighborhood-level risk of partner violence may be quite different from those that influence the geographic distribution of partner violence at the macro level.

Together these findings suggest a number of avenues that policy makers could consider to help reduce overall population prevalence of domestic violence. Although the findings suggest that the rate of partner violence declines as countries modernize, the implications for women's health and well-being are too profound to rely on "development" as the sole driver of change. As with other transitions that accompany development—such as the shift to lower fertility or the decline in infectious disease—countries can "speed up" the process of constructive change through strategic intervention.

For example, while many other factors combine to influence risk of abuse at an individual and relationship level, it appears that a significant driver of the difference in rates across settings is the degree to which the behavior is or is not perceived as normative. While dismantling norms that condone abuse will not fully eliminate the problem, it will help reduce disparities in the rates of abuse across countries. Moreover, it is difficult to imagine any strategy making progress in a country where even women believe the behavior is both unavoidable and justified.

Policymakers should likewise prioritize investments that create positive synergies between other development objectives—such as expanding women's access to paid employment, reducing child marriage, and keeping girls in school—and population-level declines in partner violence. Multiple studies, for example, have shown that rates of partner violence are substantially lower for women

who have completed secondary education than for women with less or no education (Abramsky, Watts et al. 2011). A recent multilevel study in India showed that women's education appeared to exert much of its protective effect by altering population norms towards the acceptability of mistreatment (Boyle, Georgiades et al. 2009). The strength of the association between women's education and partner violence varied from community to community and the acceptability of violence at the community level muted the protective effect of higher education on individual women's risk of violence. Thus pursuing interventions such as cash transfers to keep girls in school while challenging norms around male superiority at a community level, could have positive benefits for both education and violence-related outcomes.

Similarly, leveling the playing field in terms of family codes—including laws related to marriage, divorce, child custody inheritance—might help reduce domestic violence by decreasing the emotional and economic costs of leaving abusive relationships and strengthening women's bargaining power within marriage. Successful campaigns have been waged, for example, by women's groups to transform the legal and customary regimes that discriminate against women in family law. Women's groups in Morocco worked in coalition for over 10 years to reform the *Moudawana*—the Moroccan Family code. In 2004, a new code became law which. among other things, eliminated the principle of obedience to the husband; established joint responsibility between husbands and wives within the family; implemented new divorce procedures that allowed mutual spousal divorce and divorce for irreconcilable differences; and established 18 as the legal age for marriage for both men and women (Pittman 2007). The payback from such efforts on the levels of domestic violence may be as great as or even greater than passage of laws designed specifically to criminalize abuse.

Finally, policy makers and researchers might productively explore some of the "positively deviant" countries such as the Maldives or Jordan that exhibit lower levels of partner violence than one might otherwise predict given their level of socioeconomic development. These "exceptional" cases might hold clues to yet unexplored factors that help build resilience against situations that might otherwise lead to violence. A recent study by Fulu identifies three factors that she argues have kept violence rates low in the Maldives compared to other South Asian nations: 1) the flexible nature of marriage and divorce that gives women opportunity to leave abusive relationships, without stigma; 2) a history of more equal gender relations and a less gendered notion of honour and shame than other countries in the region; and 3) a notion of masculinity that emphasizes calmness and rationality rather than male dominance and control (Fulu 2009).[28]

8.5.1 Strengths and limitations

This analysis addresses many of the limitations that have plagued earlier efforts to conduct cross national studies on the correlates of partner violence at a country-level. It relies exclusively on outcome data derived from population-based studies using face-to-face interviews, and applies a

[28] Regrettably, these protective factors are increasingly under siege with the recent coup in the Maldives and the rise of Islamic fundamentalism, with an attendent rise in patriarchal family ideologies.

consistent set of case definitions across all data sets. Unlike previous studies, this strategy ensures that the outcome data are highly comparable across sites.

In addition, I utilized a range of novel analytic techniques in order to address some of the most common challenges of conducting rigorous ecological studies of partner violence. Many ecological studies have relied on simple correlations or linear regression even though country-level data of social processes often violate the fundamental assumptions of this method. I avoided this issue by using quantile regression, a technique that is more robust in the face of outliers and skewed datasets. I also used a theory driven approach to selecting my explanatory variables, investing considerable time and energy into identifying novel sources of data for operationalizing my key constructs. To avoid losing valuable information, I employed multiple imputation with chained equations to impute missing values. This technique is especially well suited for handling data with non-monotone missings. Finally, I controlled for a potential important source of bias by adjusting the prevalence estimates to account for each country's particular age-structure.

Limitations to the analysis nonetheless remain. My findings are only as sound as the reliability of the original data sources, including both the accuracy of original prevalence studies and the soundness of methods used to generate and report the covariate data. The original prevalence studies are open to potential misclassification bias due to underreporting of violence by women, a threat to validity known to be influenced by the skill of the interviewers and the ethical and safety measures followed (Ellsberg and Heise 2005). Although all studies ostensibly used similar techniques and conformed to the WHO ethical and safety guidelines, not all DHS surveys have been equally rigorous in implementing these standards. The general sense among DHS staff is that conformity to standards has been increasing as implementing the violence module has become more routine (Kishor 2011). To avoid less reliable studies, I included only studies implemented between 2000 and 2010.

Likewise, because data for many of the potential explanatory variables were available only for certain years, it was impossible to fully match the timing between all explanatory variables and outcome data on partner violence. Data limitations meant that in a few cases, I had to use covariate data collected five or more years before the violence data were collected. This, however, applied to only a handful of cases. Moreover a review of data from countries where annual data are available suggests that shifts in macro level factors such as percentage of women in formal wage employment, move slowly. Together these observations suggest that timing inconsistencies between explanatory and outcome variables are unlikely to be a major threat to the validity of the findings. Additionally, this issue is not relevant to the many explanatory variables (like acceptability of violence) that were aggregated at the cluster level from individual responses given by participants

Finally, the depth of conclusion that can be drawn from ecological studies is suggestive rather than definitive, especially with only 40 cases. Ecological studies yield insights into associations between different population-level factors. Some of these may prove to be markers for more complex processes rather than indicators of causal links in their own right. Yet the findings of this study are highly consistent with the proposition that norms related to male dominance and the acceptability of violence play a critical role in defining the distribution of partner violence across settings. It also

provides additional support for the feminist contention that structural factors related to women's power and their access to economic and social rights and resources, help define overall levels of violence. While long accepted as received wisdom in the women's movement, this study provides important empirical support for this proposition.

Legend for Country Abbreviations:

AZB	Azerbaijan
BGD	Bangladesh
BGD2	Bangladesh2
BOL	Bolivia
BRA	Brazil
BRA	Brazil
KHM	Cambodia
CMR	Cameroon
COL	Colombia
ZAR	Congo, Dem. Rep.
DOM	Dominican Republic
EGY	Egypt, Arab Rep.
ETH	Ethiopia
GER	Germany
GHA	Ghana
HTI	Haiti
HND	Honduras
IND	India
JPN	Japan
JOR	Jordan
KEN	Kenya
LIB	Liberia
MWI	Malawi
MAL	Maldives
MDA	Moldova
NAM	Namibia
NZE	New Zealand
NGR	Nigeria
PER	Peru
PER2	Peru2
PHL	Philippines
RWA	Rwanda
SMA	Samoa
SRB	Serbia
TZA	Tanzania
TIM	Timor Leste
TUR	Turkey
UGA	Uganda
UKR	Ukraine
ZMB	Zambia
ZWE	Zimbabwe

Chapter 9: Conclusions and Recommendations for Future Research

When I first began working with WHO and a small group of colleagues to conceptualize and raise funds to support the WHO Multi-country Study, I did so with two goals in mind: 1) to collect rigorous prevalence and health impact data that could be used by local advocates to press for reform in their own countries; and 2) to seek insights into the causes of partner violence that might help inform efforts to prevent violence in the future.

At the time, I was relatively naïve and did not fully appreciate the limitations of what could and could not be deduced about causality from cross-sectional data. The same naiveté, however, spurred our small group to contemplate mounting a 15-site initiative that interviewed more than 24,000 women. Had we had fully understood the challenges ahead, we might never have embarked on this daunting but important undertaking. All in all, I am thankful for naiveté.

The question that personally motivated my involvement was a desire to better understand the large variations in the risk of partner violence that appeared to exist across settings. Already there were small-scale surveys that suggested that partner violence levels were much higher in parts of Africa, Asia and Latin America than were commonly found in high-income countries. The literature review that I conducted back in 1997 offered only intriguing suggestions of what might account for this variation. The data available were not up to answering my question. Specifically, I wanted to know what combination of factors, acting at different levels of the social ecology, best predicted individual and population risk.

This thesis is the final product of that journey. Even after completing the study, launching each of the 10 country-level reports and publishing the prevalence and health consequence data in *The Lancet*, the question that had originally captured my imagination, remained unanswered. I undertook this thesis in the hope of taking steps toward resolving this question, at least to the extent allowed by my data.

Along the way I learned many important lessons: that framing the right question is key to productive research; that statistics can only guide you so far—the rest must come from deep knowledge of content and theory; that model building is part "art" as well as science; that explanatory models require a different logic than predictive models; and that you can only get so far in understanding a phenomenon as complex as partner violence if you only have quantitative cross-sectional data to draw upon.

With these lessons in mind, I would like to summarize the major contributions of this thesis and offer some recommendations that may help to inform the next generation of partner violence research. To that end, this chapter is organized around five themes:

1. Contributions to partner violence theory
2. Insights into the nature of partner violence and its risk factors
3. Advances in measurement and methodology

4. Recommendations for future research
5. Implications for prevention programs

Specific contributions derving from *this* thesis are highlighted with arrow-type bullets below.

9.1 Contributions to partner violence theory

As Chapters 1 though 3 make clear, research on domestic violence has progressed substantially since I first examined the literature in the late 1990s. While still fragmented in disciplinary silos, the scope and sophistication of research has advanced enormously, with entirely new fields of study, including economics and developmental psychology, joining the effort to theorize the causes of abuse. Some of these fields—most notably developmental psychology—have yielded profoundly important information about the evolution of partner violence risk over the life course, at least as it manifests itself in high-income settings.

- **Reconceptualizes and updates the ecological model of abuse by incorpo-rating findings from the last 15 years of partner violence research**

The added contribution of this thesis has been to unite these disparate streams of research into a coherent whole, most notably through the updating and revision of the ecological model of abuse. While some adaptations of the model—such as that promoted by WHO—include reference to a handful of life course variables (such as antisocial behavior), no other version incorporates factors across such a wide range of disciplines.

In short, the reconfigured model summarizes the vast array of studies that have been conducted on partner violence in the last 15 years, with a strong emphasis on findings from low and middle-income countries. It provides a clearer conceptualization of partner violence than my earlier version because it separates factors related to women's risk of victimisation from those shown to increase men's risk of perpetration. Likewise, it provides greater clarity by drawing exclusively from research related to partner violence, rather than combining data on violence in intimate relationships with research on sexual victimization by strangers and acquaintances (as I had previously done). Although these two phenomenons may be related at the macro-social level, I think the individual and situational factors that combine to increase risk of rape by strangers and acquaintances may be different from those that predict partner violence.

- **Greatly expands the range of research literatures incorporated into thinking about violence causation, including insights from economics and developmental psychology.**

The revised model also incorporates insights from a growing number of long term cohort studies as well as information from economics, gender theory, international development, and developmental psychology—all literatures that have yielded important insights about how various macro-level factors may operate to affect the geographic distribution of risk. With the exception of gender theory, the material from economics, development theory and developmental psychology have largely been ignored by feminist scholars and by practitioners working to combat violence against women. I am hopeful that the revised model that draws on these literatures will bring more attention to the important factors they highlight.

- **Highlighted the need in ecological thinking for greater emphasis on establishing pathways of influence and exploring interaction among variables**

At the same time, I have come to recognize the limitations of the ecological model as a conceptual tool. While it is a useful heuristic for summarizing the research base, it does not encourage in depth consideration of pathways of influence. More can and should be done to analyze how factors interact within and among different levels of the social ecology and to explore how "upstream" macro factors exert their effect further down the chain of influence.

Future researchers should spend more time exploring possible effect modification and mediation among factors and their implications for domestic violence theory. One example of the utility of such work, is the finding in Chapter 6 that women in Brazil who contribute more than their husband's to family maintenance are at *greater risk* of systematic violence than women who contribute the same or nothing; women who own property independently are also at higher risk and having a controlling partner moderates the risk between independent ownership and risk of violence. This lends support to relative resource theory, which suggests that men may resort to violence as a "trumping" resource in situations where they perceive an unacceptable power balance. It also supports various theories that conceptualize violence as evolving in part from "destabilized masculinity" or "gender role stress" where men react to shifting gender power relations within the family and within the society at large (Fuller 2001; Gallagher and Parrott 2011) As Sarah Hautzinger observes:

> This dynamic [of increased violence] appears to be particularly evident (1) during periods of rapid social change, where male control of or access to resources is rapidly eroding; and (2) to consistently occur in conjunction with cultural values that mandate men be in control, be primary breadwinners, dominate women and children, and where violence has historically possessed some positive masculinising cultural value (Hautzinger 2003).

- **Integrates a life course perspective into ecological thinking on risk and protective factors for partner violence**

Most studies that use the ecological model as their theoretical foundation fail to incorporate the dimension of time, either in terms of integrating a life course perspective, or teasing out the sequencing of variables. This is a major oversight if we seek to get a handle on the how the propensity toward perpetration or victimization develops over time. Likewise, establishing the time ordering of variables is essential to tease out which are risk factors for violence, which are consequences of violence, and which are both. The lack of a true life course perspective in many ecological model is ironic because ecological thinking was first developed by Uri Brofenbrenner, a developmental psychologist in the field of child development (Brofenbrenner 1977) The essential elements of Brofenbrenner's theory that linked developmental issues with structural, community, relationship and other individual factors have been lost as the framework has migrated from child development into public health. My focus on the pathway diagrams for male perpetration and female victimization are an important corrective that encourages greater consideration of how variables relate in time and evolve throughout the life course.

- **Provides empirical support for a more nuanced understanding of how women's overall social and economic status, structured power inequalities between men and women, status hierarchies among men, and gender norms help define population level risks of partner violence.**

The findings from Chapters 7 and 8 clearly demonstrate that community norms related to male dominance and the acceptability of wife beating as well as macro-level factors related to women's status and gender inequality, influence the geographic distribution of partner violence. My results suggest that a country's level of partner violence is negatively associated with realization of women's economic rights; their de jure and de facto access to land, other property and credit; the proportion of women completing secondary school or enrolled in tertiary education; and women's participation in formal salaried employment. The level of partner violence is positively associated with a country's overall level of development and prevalence of norms supporting male dominance and wife beating.

These findings offer empirical support for feminist contentions that the status of women and gender inequality are indeed relevant to defining the overall prevalence of partner violence, at least in low and middle-income countries. The relative importance of gender to the aetiology of partner violence has been challenged in recent years in a series of high profile articles by scholars such as Donald Dutton, Mariam Ehrensaft, and Nicola Graham-Kevan (Dutton 1994; Graham-Kevan 2007; Ehrensaft 2008; Dutton 2010). With titles such as "Patriarchy and wife assault: The ecological fallacy" and "Intimate partner violence: Persistence of myths and implications for intervention," these articles have sought to challenge "the role of patriarchal social norms in the aetiology and maintenance of men's violence against intimate partners (p 277) (Ehrensaft 2008)." In so doing they have done both a service and a disservice to the wider field of violence prevention.

Like me, Dutton, Ehrensaft and Graham-Kevan have argued for greater integration of findings from other disciplines into evolving theories of partner violence—especially those related to developmental psychology in the case of Ehrensaft and psychopathology in the case of Dutton. They rightfully point out that in some quarters, feminist advocacy for woman-centerd approaches to violence have ossified into ideologically driven and rigidly (sometimes legally) enforced norms about what types of research and intervention are valid to pursue. This is especially true with respect to US and some British and European advocates who have successfully fought for laws and standards that mandate certain approaches to treatment and intervention in cases of partner violence and outlaw others (Graham-Kevan 2007).

In raising this valid critique, however, they fall prey to their own set of fallacies—namely that gender has little to do with the distribution of partner violence and that feminist analysis necessarily implies that patriarchy is the ***sole*** cause of the problem. Dutton especially seeks to discount the relevance of patriarchal norms and structures in the aetiology of abuse by citing empirical studies that fail to demonstrate a substantial association between women's status and levels of partner violence in the US (Yllo and Straus 1990) or between men's patriarchal beliefs and the risk of perpetrating partner violence among men in Toronto (Smith 1990). In his 2006 article, "Transforming flawed policy: A call to revive psychology and science in domestic violence research and practice," he concludes: "Simply put, the evidence for theoretical patriarchy as a 'cause' of wife assault is scant."

It may well be that the *relative* role that gender-related norms and patriarchy play in the aetiology of individual cases of partner violence is less in high-income countries than in low-income countries. My findings, however, suggest that it is equally inappropriate to summarily discount gender norms and hierarchies as a contributing cause of partner violence. The lower levels of partner violence seen in most high-income countries could easily be because the norms, beliefs and social structures that are driving high levels of partner violence in the developing world have already been largely transformed in high-income settings.

My current hypothesis is that the developmental pathways to partner violence through antisocial behavior, trauma, and social learning likely operate to some degree in all settings and may account for the largest share of partner violence (together with situational and relationship factors) in places like the United States, Britain and Australia.[29] The vastly higher rates of partner violence seen in many developing countries may be due to the added influence of social and economic forces that privilege men as a class over women and which translate into norms that justify wife beating and promote rigid expectations regarding male and female roles in the family and in society at large.

This is not to say that gender plays *no* role in partner violence in places like the US and Europe. The research suggests that even if the developmental pathways through antisocial behavior, trauma and social learning dominate the etiology of abuse in places like the United States, norms around gender still play a role in shaping the dynamics and likelihood of abuse. For example, longitudinal research in the United States has documented that hostile talk about women, encouraged and reinforced through association with deviant peers, is an independent predictor of partner violence in young adult men (Capaldi, Dishion et al. 2001). Research also suggests that gender inequalities and authority over women played a more dominant role in the dynamics of partner violence in North America and Europe in the centuries before these countries underwent the social and economic transformations that raised the status of women and encouraged less rigid gender roles (Dobash and Dobash 1979; Pleck 1987; Gordon 2002).

Acknowledging that at this historical moment, patriarchal structures and norms play a less defining role in structuring partner violence risk in high-income countries, in no way undermines the claim that these factors play a critical role in establishing the overall *level* of partner violence in different countries and in elevating individual-level risk of violence among some couples in some settings.

Another element of the Dutton critique is that patriarchy is put forward as the sole cause of violence to the exclusion of other important dimensions. However, patriarchy and gender are being theorized in more complex ways today than in the early literature that their detractors like to cite. A new generation of feminist scholars have articulated a more nuanced understanding of patriarchy[30] that

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[29] I propose this because the processes of observational learning and reinforcement, and the physiological consequences of trauma and sustained stress in childhood, are likely to be psychobiological processes that affect all humans to some degree, regardless of culture.

[30] For the purposes of this thesis, I define patriarchy as social and economic arrangements that privilege men as a group over women as a group, both structurally and ideologically.

situates it within other hierarchies of power and recognizes that patriarchal structures and ideology manifest in different ways in different settings. As feminist theorist Gwen Hunnicut notes:

> Because patriarchal systems are bound up with other systems of domination, this concept must be situated within fields of hierarchy where old dominate young, men dominate women, men dominate men, Whites dominate people of colour, developed nations dominate developing nations, and humans dominate nature.

She goes on to observe:

> One of the limitations of early conceptions of patriarchy is that power was conceptualized in a top-down fashion, obliterating the labyrinths of power dynamics that exist in patriarchal systems. Patriarchal systems must be understood as "terrains of power" (Flax, 1993). In these terrains, both men and women wield varying types and amounts of power. Historically, analysis of violence against women using a patriarchal framework romanticized the oppressed and vilified the oppressor. Male motives were taken for granted as power maintenance, and the structural position of men was simplified and unexamined. Meanwhile, female victims were rendered helpless and powerless. In reality, there are multiple sites of power and even the most oppressed can alter relations of power.

Actually, as we have seen, men feeling powerless in the face of economic dislocation can actually contribute to partner violence, emphasizing how patriarchal systems create and reinforce various "terrains of power" including those that disadvantage men. But it the acceptance of male authority in the home and ideologies of male dominance that allow the resulting partner violence to go unchallenged and it is gender-related expectations regarding sexual purity, female obedience, and male breadwinning that position certain "infractions" by women (cited as patriarchal triggers in Figure 2.4) as legitimate grounds for violent reprisal.

It is this more nuanced understanding of patriarchy and gender that I embrace and that informs the conception of many feminists of how patriarchal ideology and structures affect violence against women. I agree with Hunnicut and others scholars like Kristen Anderson, that it essential that we maintain a focus on gender as we build toward a more complete theory of partner violence. At the same time we must embrace scholarship from other disciplines and recognize that the factors that determine population levels of violence may differ from those that predict risk for individual men and women.

9.2 Substantive insights on the nature of partner violence and its risk factors

- **Applied the technique of latent class analysis in Brazil and Peru, to create a new case definition of partner violence that includes emotional abuse**

In addition to advancing theory, this thesis is the first to employ latent class analysis as a means to identify cases of partner violence in low and middle-income countries. While a handful of scholars in high-income countries have used this technique, I am aware of only one other study (conducted by a graduate student under my supervision) that has applied this method to partner violence outside of Canada, Ireland and the United States.

My findings suggest that violence victims do sort into discrete classes that vary by virtue of the types of violence they experience (physical, sexual, emotional) and the frequency and severity with which they experience them. I identified a 4 to 5 class solution that appeared robust across Brazil, Peru, urban Namibia and rural Ethiopia. In all settings there was a category of severely abused women who suffered repeated and severe physical and sexual violence accompanied by high intensity emotional abuse. This was the most stable category across setting.

It is impossible without further research to establish whether the categories identified represent actual difference in the "type" of violence experienced (as suggested by some scholars in high-income countries) or whether they reflect groupings by severity of an underlying unitary phenomenon. To explore this issue further, researchers should pursue mixed methods studies that allocate women to categories of abuse using LCA and then conduct more detailed assessment of how women in each category differ, using both more detailed quantitative information and in depth qualitative interviews with women experiencing violence that represent different LCA categories. Different classes of violence could be compared in terms of the unfolding of specific violent episodes (Who initiated them? What meaning did they have for each partner? What was the level of fear and anger experienced? What motivated or triggered the episode? What was its consequence? etc.). Insights from both the additional quantitative and qualitative work could be used to decide whether the classes seem to vary in fundamental ways beyond frequency and the severity of acts.

- **Explored the degree to which "controlling behavior" should be considered a risk factor for partner violence or a constituent part of abuse, as experienced in Brazil and Peru**

One school of scholars has argued that coercive control is the defining feature of the more systematic form of abuse known variously as "battering," "intimate terrorism," or "systematic abuse (Smith, Smith et al. 1999; Johnson 2008; Stark 2009)." Others have conceptualized controlling behavior as a correlate of severe abuse, rather than as a fundamental part of the phenomenon (Dunkle, Jewkes et al. 2004; World Health Organization 2005). Which conceptualization is correct is still a matter of debate in high-income countries; it has been hardly explored at all in developing or middle-income countries.

Our ability to move forward on this issue, including in this thesis, is greatly compromised by our failure to adequately theorize or define exactly what is meant by controlling behavior or coercive control. This lack of conceptual clarity is further exacerbated by the widespread use of competing and unclear measures of psychological abuse and "controlling behaviors." Progress on this front will require much deeper thought on how to measure and conceptualize competing notions of control, and further testing of the relationship between these concepts and different types of relationship violence in a range of high and low-income settings.

Some progress has been made by Mary Ann Dutton and colleagues who have attempted to conceptualize and develop a measure that specifically taps "coercive control" in intimate relationships (Dutton and Goodman 2005)." Dutton defines coercive control "as the credible threat of delivering a negative consequence for noncompliance," noting that coercion requires having enough power to punish effectively or to withhold a meaningful reward. With funding from the US Department of Justice, her team developed and validated a new measure of coercive control that to my knowledge has not yet been applied in the field (Dutton, Goodman et al. 2006).

Particularly important for moving the debate forward in low-income countries is developing measures that differentially tap the internalization of norms that grant men the right to control female behavior, from either coercion as a "tactic" of abuse or from psychological processes or dysfunctions that may manifest as controlling behavior (such as borderline personality disorder).

Having a partner who scores high on the WHO controlling behavior scale, serves as a risk marker for partner violence across all sites of the WHO study (World Health Organization 2005). My findings indicate that the effect size of the association increases dramatically as the severity of abuse intensifies. This could either be because violent men exhibit more patriarchal behaviors than nonabusive men (having internalized local norms), or because certain categories of abuse have at their core the use of coercive tactics. Without better, more clearly-defined measures, this question will remain unresolved.

Although constrained by data limitations, my findings do not strongly support the hypothesis that control is a key variable defining different types of violence, at least in Brazil and Peru. Both the latent class findings and factor analysis from Chapter 5 suggest that the WHO control scale is tapping a different latent construct than the violence or emotional abuse sub-scales, and that the emotional abuse questions serve as a better indicator variable for discerning categories of abuse than the control questions. While a greater proportion of women experiencing high control did allocate to the systematic violence class, a substantial proportion distributed elsewhere, including 6 to 11% of women who appeared in the no physical or sexual violence class.

- **Extended statistical modelling of partner violence to consider the combined impact of factors associated with the women, her partner, their relationship, and their childhoods.**

To date, most authors have modelled either the effect of factors related to the woman or her partner or of specific exposures in childhood (Abrahams, Jewkes et al. 2004; d'Oliveria, Schraiber et al. 2009). Relatively few have explored relationship-level factors. My thesis goes further to explore the combined effect of factors from all four domains, both together and independently. Figure 9.1 summarizes the factors that remained significantly associated with the odds that a woman would experience systematic partner violence in Brazil and Peru when all domains are considered together. Figure 9.2, summarizes those factors that lose their significance when moving from the single domain models (i.e. the woman's model or the partner's model) to the combined model. The only factors that lose their significance across both countries in the combined model are being able to count on one's family for support and completing secondary education.

Figure 9.1 Factors that remain associated with systematic abuse in the combined model

	Brazil	Peru
Respondent related factors		
Age of respondent	√	√
Sexually abused as a child		√
Early sexual debut (<15 yrs)	√	
First sex forced		√
Grew up in a maritally violent home	√	
Has two or more children	√	√
Has a current drinking problem	§	
Owns property independently	√	
Contributes more to household Income than there partner	√	
Separated, widowed, divorced	√	
Partner-related factors		
Partner's mother beaten	√	√
Partner beaten as a child	√	√
Exhibits multiple controlling behaviors	√	√
Is seen drunk once a week or more	√	√
Engages in physical fights with other men	√	√
Has outside sexual partners	√	√
Partner uses illegal drugs	√	√
Relationship-related factors		
Low couple communication	√	√
High degree of conflict and quarrels	√	√
Living together, not married	√	√

√ = significant at the p<0.05 level § = significant at the p=0.1 level

Figure 9.2 Factors that lose their significance when integrated into the combined model

	Brazil	Peru
Respondent related factors		
Sexually abused as a child	√	
Early sexual debut (<15 yrs)		√
First sex forced	√	
Grew up in a martially violent home		√
Completed secondary education	√	√
Has a current drinking problem		√
Contributes more to household Income		√
Separated, widowed, divorced		√
Can count on family for support	√	√

Despite being no longer statistically significant, most of these factors have a similar impact on the odds of abuse in the woman-only and combined model (i.e. the same effect size). This suggests that the association may have lost significance simply due to the large number of covariates being considered in the model, compared to the number of systematic abuse cases available for analysis. Also, the early childhood models confirm that these variables are significant in all sites, but that their effect size declines and some lose significance in the combined model because their influence is partly mediated through variables further down the causal pathway.

- **The thesis offers some intriguing suggestions on how various factors may influence the odds of partner violence.**

Results from Chapter 6 suggest that part of the way that having many children, problematic alcohol use, extramarital affairs, and men's controlling behavior work to increase risk of partner violence, is by providing ready fodder for arguments. The adjusted odds ratios for theses covariates all decline when marital conflict is added to the model. Nonetheless all remain independent risk factors, suggesting that these factors increase risk of violence in other ways as well.

Further work should be pursued using more sophisticated techniques such as structural equation modelling to further tease out likely pathways through which different distal factors work to influence abuse.

- **Demonstrated that the risk factors for IPV-WHO in Brazil and Peru are largely similar to those predicting severe, systematic abuse, with a few minor exceptions.**

Chapter 6 demonstrated that the risk factors that emerge for IPV-WHO largely mirrored those for systematic violence, albeit with generally lower effect sizes. The risk factors related to a woman's partner are totally consistent between the two measures, as are the relationship-level factors. In Brazil, exceptions emerged around women's asset ownership and contribution to family income, which appeared as strong risk factors only for systematic abuse. Tests for interaction between relative contribution to family income and male control of female behavior were significant,

suggesting that in Brazil, gender-related attitudes and male control may moderate the effect of women's economic status on her risk of systematic violence.

9.3 Advances in methodology

- **Used LCA to create a case definition of partner violence that includes emotional as well as physical and sexual abuse.**

One significant advantage of LCA is that it identifies cases of partner violence in the way that women experience it—as a pattern of overlapping types of violence, where emotional abuse plays an important role. Indeed, my analysis suggests that the relative intensity of emotional abuse is one of the factors that helps differentiate among categories of abuse. In Peru, for example, fully 87% of women categorized as experiencing systematic abuse, experienced high intensity emotional abuse, whereas less than 1% of "mixed" cases did, even though 40 to 50 percent of women in both categories had experienced all three types of violence (physical, sexual, emotional). This suggests that it was intensity of emotional abuse that drove the allocation between these two categories.

Indeed, one of the primary advantages of LCA is that it allows researchers to incorporate emotionally abusive acts into the case definition of partner violence without requiring that the wider field (or the individual researcher) to decide a priori what combinations of acts will constitute a "case" of emotional abuse. Given that couples occasionally exchange hurtful words even in healthy relationships, it is difficult to establish what the threshold condition should be for defining "abuse."

- **Demonstrated that LCA separates the universe of "cases" differently than other case definitions of partner violence, including IPV-WHO and that proposed by Michael Johnson.**

It is interesting to note that LCA—the only data-driven approach to differentiating cases—categorizes partner violence differently than either the approach proposed by Johnson or the case definitions used by WHO. As Table 5.28 in Chapter 5 illustrates, cases that approximate Johnson's approach to defining intimate terrorism (women who experience physical or sexual violence in the context of high control), are represented across the entire spectrum of LCA categories (with the exception of emotional-only abuse). Only 54.6% of IT cases fall within the LCA category of "systematic abuse."

A similar comparison between LCA classes and cases defined as "severe" using the WHO lexicon, reveals that between one-fifth to one third of "severe" violence cases appear in the "LCA class of "physical violence." In Cuzco province, for example, 19.9% of severe IPV-WHO shows up in the "physical violence" category, 30.7% shows up as "Mixed (less severe)" group and 49.5% shows up as "systematic." Recall that the WHO approach defines a case as severe if the woman has experiences any of 4 acts classified as "severe" on the physical violence scale (s705c-s704f). Again this suggests that the two approaches give different signals regarding severity.

Multi-variable analysis with select health indicators suggests that with the exception of suicide attempts, the odds of experiencing negative health outcomes are substantially higher for cases categorized as systematic or mixed compared to those identified as severe IPV-WHO. This suggests

that the LCA approach to identifying violence sub-groups is more effective than standard definitions in identifying women at most risk of negative outcomes (See Table 5.24 in Chapter 5).

- **Explored the foundational question of whether the field should exclude from its definition of partner violence, women or men who have experienced single incidents of "moderate only" violence in their lifetime**

Intriguingly, the detailed analysis of the patterning of violence in Brazil and Peru revealed that a not inconsequential number of cases identified using the WHO case definition, are women who have experienced one or two isolated acts of moderate violence in their lifetime. A legitimate question is whether these single incidents should be included in the case definition of abuse.

Feminists have long argued that partner violence by definition is a pattern of abusive behavior, not isolated acts of assault. For this reason, I recommend that researchers report two measures—the prevalence of individual incidents of moderate assault (slap, push, shove); and partner violence (defined by either LCA or IPV-WHO minus single moderate incidents). This avoids potentially combining "apples" and "oranges" and makes data reporting more transparent.

- **Demonstrated that in the absence of LCA, IPV-WHO can serve as a reasonable surrogate for identifying risk factors for severe abuse**

Chapter 6 also suggests that in the absence of LCA, IPV-WHO can serve as a reasonable surrogate for identifying risk factors for severe abuse, but effect sizes will be seriously underestimated. This suggests that it would be inappropriate to extrapolate effect sizes for systematic abuse from studies that used IPV-WHO. Nonetheless, it may well prove possible to infer which factors are likely to be important predictors of systematic abuse, based on studies using IPV-WHO. My analysis confirms this possibility for Brazil and Peru, but it remains to be seen whether this finding holds up in other settings.

- **Highlighted the importance of using a reference group that excludes cases of emotional abuse in order to get accurate estimates of effect size.**

Table 6.14 demonstrated that the existing practice of using a reference group for IPV-WHO that includes cases of emotional abuse reduces the effect size of predictive co-variates, at times substantially. This is both quantitatively and conceptually problematic because it means that many studies are not using a true "no partner violence" reference group. I recommend that the field shift to a definition of IPV-WHO that excludes from the reference group any woman who has experienced physical, sexual or emotional partner violence.

9.4 Implications and recommendations for future research

The outcomes of this thesis highlight a number of important limitations of the existing research base and suggest productive avenues for future investigators to pursue.

1. More longitudinal cohort studies are essential

The primary lesson I draw from this experience is the importance of shifting emphasis from cross-sectional household surveys to longitudinal studies, especially in low-income settings. Our current reliance on the DHS and other surveys as the primary source of data on violence severely limits our ability to establish the temporal relationships among variables. It also complicates efforts to integrate a developmental perspective into research on violent victimisation and perpetration. Indeed, I question the value of continued funding for household surveys on violence (beyond the DHS), except in those settings where national data are needed to make the advocacy case for local policy reform. Rather donors and investigators should shift their focus toward prospective studies, preferably panel surveys or longitudinal studies that follow individuals over time.

Donors and investigators should consider mounting a handful of longer term studies that track young women and men from adolescence through the early years of marriage and parenting. Even more ambitious would be to replicate or adapt in the developing world, one of the birth or early childhood development cohorts that have yielded such invaluable information on a range of topics related to child development, parenting, and the impact of early adversity and abuse, and peer influence on later behavior in adolescence and adulthood. As part of a larger developmental study, these children could be followed forward in time to see which factors predict later risk of partner violence or other negative outcomes.

There is also much untapped potential for collaboration with other research groups that are already planning to conduct multiple survey rounds or follow individuals over time as part of studies on related topics. Where it is not possible to launch independent studies, investigators should partner with others to integrate questions on violence and violence-related risk factors into questionnaires designed for other purposes.

2. Increased focus on causal pathways

The next wave of research must focus more explicitly on elucidating causal pathways to establish what portion of observed associations represent potential contributing causes to abuse, and what portion reflect effects of abuse. This is particularly true with respect to factors such as depression, stress, alcohol and drug use, and marital conflict. Having prospective data will help address this challenge, but there is also room for creative application of more sophisticated methodologies, such as Directed Acyclic Graphs (DAGs), structural equation modeling (SEM), and the like.

Structural equation modeling holds particular promise in testing hypothesized pathways of influence. SEM is a highly flexible methodology for representing, estimating and testing a network of relationships among both measured and latent variables. Unlike traditional statistical techniques that specify a default model, SEM requires investigators to detail their hypothesized model up front, based on theory and prior research. It then allows researchers to test the degree to which their hypothesized model fit the data (Suhr 2006).

My approach of testing specific direct and indirect pathways among variables using traditional GEE, loosely approximates the insights that can be gained from SEM. But SEM is a more robust technique

that takes into account measurement error and that can analyze complex relationships among variables all at once, rather than sequentially test elements of a path diagram. Likewise while traditional techniques can suggest whether and how intermediary variables may be mediating an effect, SEM can formally model both direct and indirect pathways (Kline 2011).

3. Incorporation of key covariates in future studies

Findings from this thesis and insights from the extent literature suggest that all future studies on partner violence should seek to collect information on the following co-variates, many of which are not part of the standard questionnaires currently in use:

- A full range of adverse events in childhood, including physical, sexual and emotional abuse or neglect, having an alcoholic or drug using parent, routinely receiving harsh physical punishment, parental death or abandonment, etc.
- Antisocial behavior in adolescence (operationalized appropriately for different settings)
- Measures related to stress/frustration
- Improved measures of economic position, including timing of key events related to employment, unemployment, job seeking, access and control over different types of resources, etc.

In addition, there is need to gather more extensive information about the meaning and consequences of different violent episodes (Did the episode invoke fear, distress or cause other negative consequences? Was the violence mutual or primarily initiated by one party? Did the victim fight back? What was the professed motivation or "cause" of the event?) This type of contextual information is already being collected by some investigators, and will become ever more important as researchers begin collecting act-based information from both men and women.

4. More formative work to identify new factors that may be important to shaping violence at a community level

This thesis has demonstrated that there are a number of factors operating at the cluster or community level that affect the population level of partner violence. In Brazil and Peru, for example, norms regarding male control of female behavior and the acceptability of wife abuse appear among the strongest social forces shaping the geographic distribution of partner violence. Additionally a range of other factors related to dominant masculinities appear important, including the proportion of men who are frequently drunk, the proportion of men who have outside sexual partners; the proportion who fight with other men. These results are intriguing, but there is undoubtedly more room to theorize additional factors that could affect the distribution of partner violence between settings.

O'Campo and colleagues (O'Campo, Burke et al. 2005), for example have been using concept mapping with neighborhood members in North Baltimore to solicit their views on neighborhood factors that affect the overall level of partner violence in their community. This exercise has surfaced a number of interesting possibilities that could be tested empirically for their link to neighborhood rates of partner violence. For example, low-income African American women

identified access to public health facilities, community centres, and recreational centres for children among those enrichment resources they linked to lower levels of partner violence. They likewise proposed the density of lay-offs, mental illness, youth homicide, gossip, and single mothers as possible community factors associated with higher levels of abuse.

Likewise, we need to begin to explore other group contexts that may be relevant to shaping overall levels of partner violence (peer groups, workplaces, or other policy-relevant settings). My findings clearly suggest that norms are important drivers of partner violence rates, but norms function to shape behavior through many different reference groups. Presently we have only examined differences by cluster as a proxy for neighborhood, potentially missing other units of analysis that may prove even more critical as crucibles for norm-induced behaviors.

5. Greater commitment to trans-disciplinary work and integration

Finally, donors and researchers must seek to break down the disciplinary barriers that are currently hampering forward progress in the field. Especially critical is overcoming the ideological battles that have all but paralyzed research progress into partner violence in North America. Donors could help by creating venues for cross-fertilization between disciplines and between researchers, advocates, and programme implementers. Particularly helpful might be calls for proposals that require violence researchers to come together from different disciplines in order to compete for available funds.

9.5 Post script: Implications for future prevention efforts

At the end of this odessy, it would be remiss not to say a few words about the possible implications of the findings for efforts to prevent partner violence. Although the thesis itself has focused quite heavily on methodological and research issues, it has yielded some insights worthy of more concerted action in gender violence programming, especially in low and middle income countries.

Admittedly, cross sectional data does not confirm causality, but together with other studies in the extant literature, my findings do suggest a number of avenues for action. I take up the challenge of exploring the implications of my findings for prevention in a separate publication entitled, *What works to prevent partner violence: An evidence based review* (Heise 2011). Space prevents me from sharing this analysis in depth, but let me highlight a few top-level findings.

First and perhaps most importantly, existing research (including this thesis) underscores the importance of programs to dismantle social norms that justify wife beating and that grant men the right to control female behavior. Promising programs exist that seek to challenge prevailing norms around sexuality, gender-related roles and expectations, and privacy in the family, using a combination of reflection groups, large and small-scale media, and community organizing approaches. These efforts could be strengthened by more concerted integration of insights from theory and research on what works to transform norms (Paluck and Bell 2010).

Second, efforts to reduce partner violence in adulthood must make common cause with programs to address violence in childhood and other efforts to reduce childhood adversity including early childhood development programs (an increasing focus of UNICEF), social protection programs, and parenting skills training. Much more could be done to strengthen these programs by integrating

information and skills building to promote non-violent forms of discipline, greater appreciation of the destructive potential of rigid gender socialization, and more support for struggling families.

Third, a wide range of studies confirms that excessive alcohol use by men increases both the frequency and severity of partner violence. Alcohol has been linked to violence perpetration in nearly every setting it has been studied and longitudinal research has demonstrated a strong association between violence and drinking occasions. Studies have demonstrated a reduction in domestic violence after the implementation of strategies to reduce alcohol availability in the United States, Greenland, and Australia, as well as reduction of violence after abusers have been treated for alcohol abuse. Although alcohol use is neither necessary nor sufficient for abuse to occur, data suggest that lowering the rates of binge drinking could reduce the overall level and severity of partner violence.

Fourth, as discussed in chapter 8, greater attention should be placed on policy interventions that hold promise to yield multiple development benefits at once. Efforts to extend girl's education through secondary school, expand women's access to waged employment outside of the home, eliminate gender-bias in family law, and reduce child marriage, are valuable in their own right and hold promise for reducing partner violence by improving women's agency and encouraging the emergence of more gender equitable norms.

Finally, we must recall Geoffrey Rose's observation that what make individuals sick may not be the same as what accounts for the geographic distribution of disease (Rose 1985). The same can be said for partner violence and other social problems. Prevention programs must focus their gaze upstream to address the structural realities that determine the levels of violence in society and use these insights to hasten the day when fewer women, men and families suffer the persistent consequences of abuse.

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Chapter 10 Appendices

APPENDIX A.

Abramsky T, Watts C, Garcia-Moreno C, Devries K, Kiss L, Ellsberg M, Jensen H, Heise, L. (2010) "What factors are associated with recent intimate partner violence? Findings from the WHO multi-country study on domestic violence and women's health" Biomed Central Public Health 11(109): 1-17.

APPENDIX B. Multi-level and contextual analysis of partner violence

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
Boyle et al, 2009	Multilevel logistic regression using MLwiN N=68,488	Indian women interviewed as part of the 1998-9 National Family Health Survey	IPV in the last 12 months Women identifying partner after gateway question: Since you completed 15 years of age, have you been beaten or mistreated physically by anyone?	*Community level:* Women's education Household SES Acceptance of partner violence *Individual level:* Age Family structure Total number of children Working outside the home Physical mistreatment by others Urban residency	IPV showed substantial clustering at both the state and community lelvel accounting for 10.2% and 11.5% of variance respectively At the individual level, there was a strong, nonlinear association between women's education and IPV, partially accounted for by household SES. The strength of association between women's education and IPV varied from one community to the next with evidence that level of community acceptance of wife beating mutes the protective effect of higher education. At the community level, women's education appeared to exert much of its protective influence by altering population attitudes toward the acceptability of violence	Very large sample with high variation of IPV among communities Use of a single gateway question for eliciting abuse may have limited disclosure and dampened the effects found.
Li et al, 2009	Multi-level logistic regression Accounted for clustered nature of the data	Jefferson County, Alabama	IPV during index pregnancy or physical and/or sexual IPV in last year	*Neighborhood level:* Concentrated disadvantage; residential stability; violent crime *Individual level*: bonds between partners; household stressors; alcohol	Neighborhood residential stability remains strongly associated with elevated risk of IPV when one controls for relevant individual and household factors. Couple level factors (lack of involvement or commitment between partners) remain associated after controlling for relevant	

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
	N=2887			use; mastery, self esteem, age at first intercourse, education, no paying job	neighborhood and individual factors. The between neighborhood variance component goes from significant to insignificant when the neighborhood level factors are added to the individual/household model indicating that the neighborhood contextual variables adequately explain the variability of IPV among neighborhoods	
Ackerson et al, 2008a	Multi-level logistic regression using ML*wi*N N=83,627	Married Indian women interviewed as part of the 1998-9 National Family Health Survey Data from 1991 Indian Census to identify whether neighborhood was in a large city, small city, or rural area	IPV in the last 12 months Women identifying partner after gateway question: Since you completed 15 years of age, have you been beaten or mistreated physically by anyone?	*Community level:* Level of overall male literacy Level of overall female literacy *Individual level:* Age, age at marriage, religion, social caste, education or woman and education of partner, spousal education differential, standard of living, employment status, and location of neighborhood	In adjusted models, odds of recent IPV among women without any education were 5.61 [CI: 3.53, 8.92] times those of college-educated women, and the odds among wives with uneducated husbands were 1.8 times [CI: 1.05, 1.33] those of wives of college educated men. Women whose individual educational attainment is higher than their husbands are at increased risk of IPV. Living in a neighborhood with low levels of literacy mutes the protective effect of secondary education on women's risk of violence Women with lower levels of education, gain very little if anything in terms of lifetime risk of IPV by living in high literacy neighborhoods.	The global question used in this study has been found to be less than optimal in eliciting abuse

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
Ackerson et al, 2008b	Multi-level logistic regression using ML*wi*N N=83,627	Married Indian women interviewed as part of the 1998-9 National Family Health Survey Data from 1991 Indian Census to identify whether neighborhood was in a large city, small city, or rural area	IPV in the last 12 months Women identifying partner after gateway question: Since you completed 15 years of age, have you been beaten or mistreated physically by anyone?	*Community level:* State level gender equality State level per capita income State level human development score *Neighborhood level:* Neighborhood SES *Individual level:* Age, age at marriage, religion, social caste, education of woman and education of partner, spousal education differential, standard of living, employment status, and location of neighborhood	The study demonstrates differences in IPV between neighborhoods and states after adjusting for individual correlates of abuse. State level differences are partially explained by state levels of gender inequality	The global question used in this study has been found to be less than optimal in eliciting abuse Individual measures do not control for childhood factors or partner factors other than partner education.
Koenig et al. 2003	Multi-level logistic regression N=10,368	Jessore & Siranjgonj districts of Bangladesh	Ever physical violence by partner	*Community level:* Women's education Credit group membership Women's autonomy index *Individual level:* Wife's age & education Husband's education Number of living sons Landholdings Family structure *Women's status variables*: Credit group membership Women's autonomy index	Effects of women's status variables were context specific. In the more culturally conservative area, high individual level autonomy and short term membership in credit groups were associated with significantly elevated risks of violence, and community level variables were unrelated to violence. In less culturally conservative areas, individual level women's status indicators were unrelated to risk of violence and community level measures of status were associated with significantly lower risks of violence.	Study uses single item on violence to measure IPV Should probably have used

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
Koenig, 2006	Multi-level logistic regression	Uttar Pradesh India N=4520 married men	Physical violence against partner in preceding year Sexual violence against partner in preceding year	*Community level*: Economic index Female education Electricity Wife beating norms District murder rate *Individual level:* Husband's and wife's education Household asset index Economic pressure Childlessness Childhood exposure to violence Husband has outside affairs	*Protective for physical:* Education, household assets *Increased risk for physical:* Economic pressure; marital duration; childlessness; extramarital affairs; intergenerational exposure to violence *Significant contextual variables* Community wife beating norms (for physical violence only) District murder rate (for both) SES appears to operate at household level For sexual IPV, only husband's education, economic pressure, childlessness, extramarital affairs, intergenerational violence, and district murder rate were significant. Random intercept for PSU level was significant, indicating a significant level of unexplained variation.	Used only single IPV question Men tend to under-report violence leading to possible misclassification bias First study to include broader array of individual level variables, including childhood exposure to violence
Cunradi et al., 2000	Multi-level logistic regression N=1440 couples	US couples interviewed as part of 1995 National Alcohol Survey	Dichotomous measures of past year IPV measured using the CTS; Separate measures for MFPV and FMPV.	*Community level* Neighborhood poverty assessed by 1990 census tract. *Individual level* Age and age difference Education and educational difference; no of children at home; alcohol problems;	Black couples living in impoverished neighborhoods had 2.87 times the risk of experiencing MFPV ($p<0.01$) and a twofold greater risk of FMPV. Nearly 47% of black couples resided in poor neighborhoods. White couples residing in impoverished neighborhoods had a near fourfold risk of FMPV compared to couples not residing in poor neighborhoods.	Responses were based on interviews with both members of each couple Episodes of severe violence in this sample were rare, so the findings may not apply to more severe

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
				impulsivity; approval of marital violence, childhood violence, household income	Neighborhood poverty is associated with interpersonal violence, but the strength of that association may vary across communities.	abuse.
McQuestion 2003	Multi-level logistic regression	6131 women interviewed as part of Colombia's 1995 DHS survey	Has your husband ever hit you? Has your husband ever forced you to have sex?	*Community:* One or more other reports of forced sex in cluster Cluster beating mean above sample mean *Individual:* Marital status Age Number live births Education of self and partner Occupational prestige of self and partner Rural residence	Likelihood of a woman experiencing coerced sex or beatings by her current partner is associated with the proportion of adjacent women who experienced same phenomena. This social interaction effect explains a significant amount of unexplained variance in the case of beatings. Magnitude of these social effects are as large or larger than any individual control variable.	Uses single gateway question on violence Early DHS surveys are known not to have implemented specialized training for interviewers and ethical controls known to affect disclosure.
O'Campo et al. 1995	Two level Logistic regression using GEE	182 low income women living in Baltimore	Severe or moderate physical and/or verbal abuse by an intimate partner within the last 6 months, measured using the CTS	*Neighborhood level:* Average per capita income Ratio of home ownership to rentals Unemployment rate Per capita crime rates [derived from census data] *Individual level*: Social support, partner drug use and demographic variables	Three of the four neighborhood level factors—ratio of home owners to renters, high per capita income, and unemployment rate—were significantly associated with the risk of partner-perpetrated violence. Per capita crime rates were not associated with IPV	Small sample size resulted in numerous clusters with a single observation leading to unstable estimates of variances for binary outcomes

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
Pallitto & O'Campo 2005	Two level logistic regression	3431 women who had been pregnant in the 5 years prior to the survey in the 2000 DHS from Colombia	Unintended pregnancy in the last 5 years Dichotomous abuse variable if women ever report experiencing any of several acts of physical and/or sexual abuse "sometimes" or "frequently	*Community level* Women's autonomy as measured by 3 different spheres of decision making; women's status; degree of male patriarchal control *Individual level* Demographic, socioeconomic and fertility-related characteristics	IPV was associated with unintended pregnancy and living in a municipality where men exhibit high levels of patriarchal control and high rates of IPV increased women's individual risk of unintended pregnancy after controlling for individual factors and personal experience of partner violence	
Van Wyk et al., 2003	Logistic regression	1994 US National Survey of Families and Households (NSFH) & US census data Probability sample of 5624 couples	Dichotomous variable of physical violence using the CTS	*Community level:* Structural disadvantage based on factor loading of 14 census variables *Individual:* Length of relationship Cohabitation vs marriage Minority status SES Subjective financial satisfaction (SFS) Male unemployment Female assistance Social support (3 groupings based on factor analysis of 11 sources of social contact)	Partner violence was more than twice as likely to occur in highly disadvantaged neighborhoods compared to those economically better off. Race, marital status, and social contact with acquaintances affect the likelihood of partner violence differently depending on where the couple lives. The findings do not support social disorganization theory because it did not find the strongest correlation between individual risk factors and IPV in the most disorganized neighborhoods.	Does not appear to control for clustered nature of the data, therefore confidence intervals are likely too narrow.

	Type of Analysis	Location	Outcome variable	Explanatory variables	Findings	Strengths and Limitations
Miles-Doan (1998)	Ecological Regression analysis adjusted for spatial autocorrelation N = ~4975 incidents in 131 census tracts	Duval County Florida	IPV and assaults by family, friends or acquaintances reported to police	Resource deprivation & structural density/residential mobility indices created through principal components analysis	Deprived neighborhoods (with high concentrations of poverty, of unemployed males, and of female headed households with young children) have dramatically higher rates of IPV than other neighborhoods (9 times higher). Standardized beta coefficients for deprivation are similar for IPV and FFA (0.45 v. 0.44) but the models explain more of the variation in FFA (R^2=.51) than of IPV (R^2 = .26)	Cannot tease out individual compositional effects from true contextual effects; Minorities and residents living in poor neighborhoods may be less likely to report IPV to the police

APPENDIX C. Latent Class Results for Ethiopia and Namibia

Namibia LCA Results

	Namibia Latent Class Analysis Model Parameters								
Model description	LL	BIC(LL)	Npar	L^2	BIC(L^2)	df	Bootstrap p value	Class.Err.	Entropy
4 cluster restricted, bootstrap	-11418.5	23189.33	43	176.66	-765.6	115	0.0002	0.06	0.88
5 cluster, bootstrap	-11389.1	23220.67	54	117.87	-734.2	104	0.17	0.08	0.90
5 vs 4, significant?	-11389.1	23220.67	54	117.87	-734.2	104	0.17	0.08	0.90
6 cluster, restricted	-11367.4	23267.34	65	74.42	-687.6	93	0.92	0.12	0.86
6 vs 5, restricted, significant?	-11367.4	23267.34	65	74.42	-687.6	93	0.92	0.12	0.86

NAMIBIA Profile Matrix	No violence	Systematic	Mixed less severe	Physical	Sexual dominant
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Percent of cases in cluster	0.42	0.15	0.18	0.06	0.17
Emotional violence					
no emotional violence	0.61	0.00	0.06	0.43	0.36
two or less forms infrequent	0.32	0.10	0.69	0.50	0.52
three or more infrequent	0.01	0.00	0.18	0.02	0.02
two or less frequent	0.05	0.46	0.06	0.03	0.09
three or more frequent	0.00	0.44	0.00	0.02	0.01
Physical violence					
No physical violence	1.00	0.00	0.00	0.00	0.91
Moderate only (1 or 2 acts)	0.00	0.05	0.11	0.39	0.05
Moderate only (few, many)	0.00	0.10	0.18	0.11	0.03
Severe Violence	0.00	0.85	0.71	0.50	0.01
Sexual violence					
No sexual violence	1.00	0.21	0.33	0.86	0.00
Once	0.00	0.02	0.13	0.13	0.16
A few times	0.00	0.18	0.34	0.00	0.45
Many times	0.00	0.59	0.20	0.01	0.39

Namibia LCA Results

NAMIBIA Probability Matrix	No violence	Systematic	Mixed less severe	Physical	Sexual dominant
	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Percent violence type in cluster	0.42	0.15	0.18	0.06	0.17
Emotional violence					
no emotional violence	0.72	0.00	0.03	0.08	0.17
two or less forms infrequent	0.34	0.04	0.32	0.08	0.22
three or more infrequent	0.10	0.00	0.78	0.03	0.09
two or less frequent	0.17	0.59	0.10	0.02	0.13
three or more frequent	0.03	0.93	0.01	0.02	0.02
Physical violence					
No physical violence	0.73	0.00	0.00	0.00	0.27
Moderate only (1 or 2 acts)	0.00	0.13	0.32	0.40	0.15
Moderate only (few, many)	0.00	0.25	0.55	0.11	0.09
Severe Violence	0.00	0.44	0.44	0.11	0.00
Sexual violence					
No sexual violence	0.74	0.06	0.11	0.10	0.00
Once	0.00	0.05	0.38	0.13	0.45
A few times	0.00	0.16	0.38	0.00	0.46
Many times	0.00	0.46	0.19	0.00	0.35

APPENDIX C (Continued)

Ethiopia Results

	Ethiopia Latent Class Analysis Model Parameters									
Model description	LL	BIC(LL)	Npar	L^2	BIC(L^2)	df	P value	Bootstrap p value	Class.Err.	Entropy R^2
4-Cluster	-7575.28	15482.67	43	129.2979	-758.912	115	0.17	0.0000	0.06	0.89
5-Cluster	-7559.09	15535.25	54	96.9158	-706.335	104	0.68	0.0000	0.14	0.80
6-Cluster	-7541.1	15584.23	65	60.9389	-657.352	93	1.00	0.0040	0.17	0.78
7-Cluster	-7541.13	15669.24	76	60.7047	-572.627	82	0.96	0.0020	0.17	0.77
8-Cluster	-7523.5	15718.96	87	25.748	-522.625	71	1.00	0.1140	0.18	0.77

ETHIOPIA Profile Matrix	No violence	Mixed less severe	Sexual dominant	Systematic
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Percent of cases in cluster	0.29	0.28	0.24	0.19
Emotional violence				
no emotional violence	0.35	0.05	0.35	0.00
two or less forms infrequent	0.55	0.73	0.55	0.11
three or more infrequent	0.01	0.13	0.01	0.01
two or less frequent	0.09	0.09	0.10	0.48
three or more frequent	0.00	0.00	0.00	0.40
Physical violence				
No physical violence	1.00	0.00	0.94	0.00
Moderate only (1 or 2 acts)	0.00	0.18	0.01	0.05
Moderate only (few, many)	0.00	0.14	0.04	0.10
Severe Violence	0.00	0.68	0.01	0.84
Sexual violence				
No sexual violence	1.00	0.35	0.00	0.13
Once	0.00	0.14	0.12	0.02
A few times	0.00	0.30	0.46	0.18
Many times	0.00	0.21	0.42	0.67

ETHIOPIA Probability Matrix	No violence	Mixed less severe	Sexual dominant	Systematic
	Cluster1	Cluster2	Cluster3	Cluster4
Percent of cases in cluster	0.29	0.28	0.24	0.19
Emotional violence				
no emotional violence	0.52	0.07	0.42	0.00
two or less forms infrequent	0.31	0.40	0.25	0.04
three or more infrequent	0.05	0.83	0.06	0.06
two or less frequent	0.16	0.15	0.14	0.55
three or more frequent	0.01	0.00	0.00	0.99
Physical violence				
No physical violence	0.57	0.00	0.43	0.00
Moderate only (1 or 2 acts)	0.00	0.80	0.04	0.16
Moderate only (few, many)	0.00	0.57	0.14	0.28
Severe Violence	0.00	0.53	0.00	0.46
Sexual violence				
No sexual violence	0.70	0.23	0.00	0.06
Once	0.00	0.56	0.39	0.05
A few times	0.00	0.37	0.48	0.15
Many times	0.00	0.21	0.34	0.45

APPENDIX D. Stepwise Regression of Childhood Factors Associated with Women's Adjusted Odds of IPV-WHO in Brazil and Peru

Childhood Factors Associated with Women's Adjusted Odds of IPV-WHO, BRAZIL

	(1)		(2)		(3)		(4)		(5)	
Age	1.07**	[1.02,1.13]	1.08**	[1.03,1.14]	1.12***	[1.06,1.18]	1.11***	[1.05,1.17]	1.12***	[1.06,1.19]
Site=Pernambuco	1.49***	[1.21,1.83]	1.53***	[1.24,1.89]	1.40**	[1.14,1.73]	1.38**	[1.12,1.70]	1.45***	[1.18,1.80]
Sexual abuse <15			**3.18***	[2.26,4.48]	**2.65***	[1.86,3.78]	**2.43***	[1.69,3.49]	**2.30***	[1.59,3.33]
First sex <15					3.01***	[2.30,3.93]	2.88***	[2.19,3.77]	2.88***	[2.18,3.80]
First sex forced							2.43***	[1.44,4.12]	2.27**	[1.33,3.88]
Mother beaten									2.20***	[1.65,2.93]
Observations	2127		2127		2122		2120		2120	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Childhood Factors Associated with Women's Adjusted Odds of Partner Violence (Systematic), BRAZIL

	(1) systematic		(2) systematic		(3) systematic		(4) systematic		(5) systematic	
Age	1.1***	[1.1,1.2]	1.2***	[1.1,1.2]	1.2***	[1.1,1.3]	1.2***	[1.1,1.3]	1.2***	[1.1,1.3]
site=Pernambuco	1.6**	[1.2,2.2]	1.7***	[1.2,2.3]	1.4*	[1.1,1.9]	1.4*	[1.0,1.9]	1.5*	[1.1,2.0]
Sexual abuse <15			**4.5***	[2.8,7.1]	**3.3***	[2.1,5.4]	**2.8***	[1.7,4.7]	**2.5***	[1.5,4.2]
First sex <15					3.8***	[2.6,5.5]	3.5***	[2.4,5.1]	3.5***	[2.4,5.2]
First sex forced							3.3***	[1.6,6.7]	3.2**	[1.5,6.6]
Mother beaten									3.7***	[2.5,5.6]
Observations	1331		1331		1327		1326		1326	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

APPENDIX D (continued)

Childhood Factors Associated with Women's Adjusted Odds of Partner Violence (IPV-WHO), PERU

Age	1.0	[1.0,1.1]	1.1*	[1.0,1.1]	1.1*	[1.0,1.1]	1.0	[1.0,1.1]	1.1*	[1.0,1.1]
Site=Cuzco	2.1***	[1.8,2.6]	2.4***	[2.0,2.9]						
Sexual abuse <15yrs			**2.7***	[2.1,3.6]	**2.5***	[1.9,3.3]	**2.3***	[1.7,3.0]	**2.1***	[1.5,2.7]
First sex <15					1.5*	[1.1,2.2]	1.3	[0.9,1.9]	1.3	[0.9,1.8]
Site=Lima					0.4***	[0.3,0.5]	0.5***	[0.4,0.6]	0.5***	[0.4,0.7]
First sex forced							3.5***	[2.6,4.6]	3.4***	[2.5,4.5]
Motherbeaten									2.5***	[2.0,3.3]
Observations	2622		2622		2614		2610		2610	

Exponentiated coefficients; 95% confidence intervals in brackets
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Childhood Factors Associated with Women's Adjusted Odds of Partner Violence (Systematic), PERU

	(1) systematic		(2) systematic		(3) systematic		(4) systematic		(5) systematic	
Age	1.2***	[1.1,1.2]	1.2***	[1.1,1.3]	1.2***	[1.1,1.3]	1.2***	[1.1,1.3]	1.2***	[1.1,1.3]
Site=Lima	0.5***	[0.4,0.6]	0.4***	[0.3,0.5]	0.4***	[0.3,0.5]	0.5***	[0.4,0.6]	0.5***	[0.4,0.7]
Sexually abused <15yrs			**6.3***	[4.2,9.4]	**5.4***	[3.6,8.3]	**5.0***	[3.3,7.6]	**4.7***	[3.0,7.4]
First sex <15					1.9*	[1.1,3.1]	1.6	[0.9,2.6]	1.6	[0.9,2.7]
First sex forced							4.0***	[2.8,5.9]	3.8***	[2.5,5.5]
Mother beaten									4.9***	[3.3,7.1]
Observations	1267		1267		1261		1259		1259	

Exponentiated

APPENDIX E. Factors associated with women's experience of IPV-WHO partner violence in Peru and Brazil

Crude and adjusted odds of partner violence IPV-WHO – Women's model, Brazil

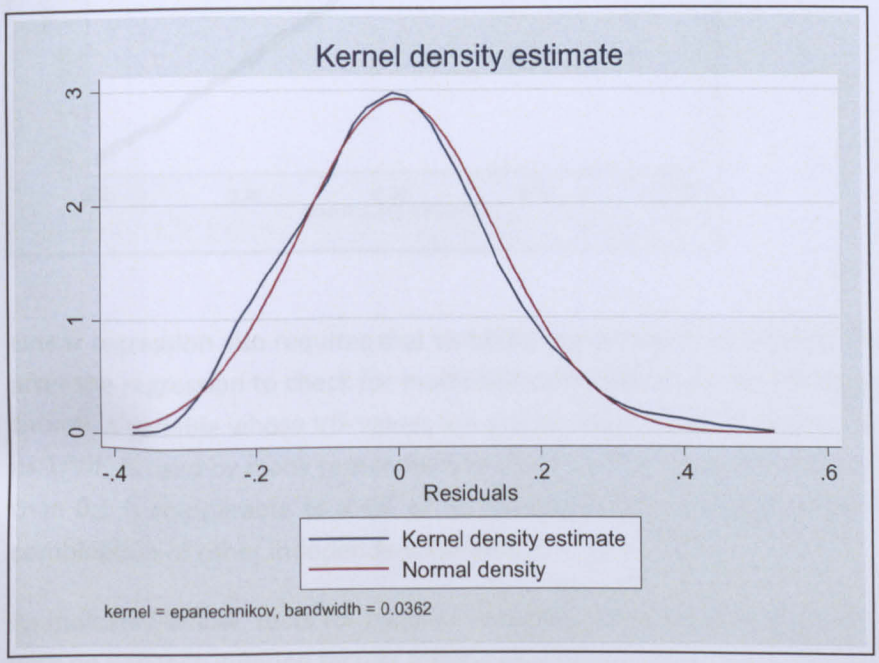
CHILDHOOD FACTORS	Crude OR	aOR	aOR	aOR	aOR	95% CI
Age respondent	1.1*	1.1***	1.1***	1.1	1.1	[1.0, 1.1]
Child sexual abuse	3.1***	2.2***	2.2***	2.1**	2.0**	[1.2, 3.1]
First sex						
< 15 years	3.4***	2.7***	2.2***	1.9***	1.9***	[1.4, 2.7]
Forced	3.9***	2.4**	2.0*	1.9*	1.8	[0.9, 3.5]
Mother beaten	2.3***	2.1***	2.1***	2.0***	2.0***	[1.6, 2.6]
Site= Pernambuco	1.5***	1.4**	1.3	1.2	1.2	[0.9, 1.5]
SOCIO-DEMOGRAPHIC						
Education (Ref=0 to 8)						
9 to 12 years	0.6***		0.9	0.9	1.0	[0.7, 1.3]
12 or more years	0.4***		0.6*	0.7	0.7	[0.5, 1.2]
Partnership status						
Living together not married	2.6***		1.9***	1.7***	1.6***	[1.3, 2.1]
Regular partner living apart	1.7**		1.7**	1.6	1.6	[0.97,2.6]
Separated, divorced, widowed	4.6***		4.1***	4.1***	2.8***	[1.7, 4.7]
Household SES (Ref: Low)						
Medium	0.7***		0.8*	0.9	0.9	[0.7,1.2]
High	0.4***		0.6*	0.7	0.7	[0.5,1.1]
CURRENT SITUATION						
Number of living children						
2 to 3	1.7***			1.6***	1.6**	[1.2, 2.1]
4 or more	3.0***			2.2***	2.4***	[1.6, 3.5]
Problems from alcohol past year	4.0***			3.7***	3.3***	[1.8, 5.8]
Acceptance of wife beating	1.5***			1.2	1.2	[0.96,1.4]
Male dominance norms						
Accepts 1 to 2 norms	1.1			0.8	0.9	[0.7, 1.2]
Accepts 3 or 4 norms	1.4*			0.9	0.9	[0.7, 1.3]
Assets (land, house, business)						
Owns independently	1.0			1.1	1.2	[0.9, 1.7]
Owns with others	0.6***			0.8	0.9	[0.7, 1.1]
Works for cash	1.1			1.2	1.2	[0.9, 1.6]
Contribution to family income						
Same as partner	1.1			1.1	1.0	[0.7, 1.4]
More than partner	1.7**			1.6*	1.4	[0.9, 2.1]
Doesn't know	1.6***					
Can count on family for support	0.5***			0.8	0.9	[0.7, 1.1]
RELATIONSHIP FACTORS						
Couple communication (High)						
Medium	2.5***				1.8***	[1.4, 2.4]
Low	3.5***				1.9**	[1.3, 2.8]
Frequency of quarrels (Rarely)						
Sometimes	1.8***				1.5***	[1.2, 1.9]
Often	9.4***				5.8***	[3.9,8.6]
Observations	2127	2119	2111	2018	2018	

APPENDIX F. Post-test regression diagnostics for final model in Chapter 7

This appendix provides details of the post-estimation tests used in Chapter 7 to ensure that the final model meets the statistical demands of least squares regression, including linearity and the normality of the residuals as demonstrated in the kernel density plot below.

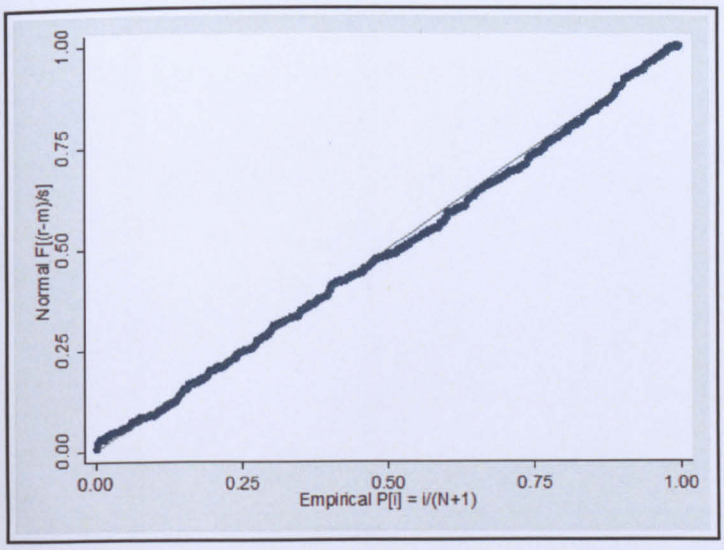
Figure A compares a plot of the residuals from the model (the blue line) with a normal curve (the red line), indicating that the residuals are normally distributed as required for linear regression.

Figure A



In STATA, the **pnorm** command graphs a standardized normal probability (P-P) plot while **qnorm** plots the quantiles of a variable against the quantiles of a normal distribution. **pnorm** is sensitive to non-normality in the middle range of data and **qnorm** is sensitive to non-normality near the tails. Figure B (next page) presents a qnorm plot of the residuals from the Chapter 7 model, confirming again that the residuals meet the requirements for linear regression.

Figure B: qnorm plot of residuals from Chapter 7 model



Linear regression also requires that variables not be highly correlated. One can use the **vif** command after the regression to check for multicollinearity. **vif** stands for *variance inflation factor*. As a rule of thumb, a variable whose VIF values are greater than 10 merit further inspection. Tolerance, defined as 1/VIF, is used by many researchers to check on the degree of collinearity. A tolerance value lower than 0.1 is comparable to a VIF of 10. It means that the variable could be considered as a linear combination of other independent variables.

As indicated below, tests for multi-collinearity reveal no problems with highly correlated variables, with no variance inflation factors greater than 10.

Variable	VIF	1/VIF
_Icountry_2	4.18	0.239353
cacceptvio	4.14	0.241400
csecondary	3.63	0.275858
loc	2.75	0.363346
cfreqdrunk3	2.40	0.417052
ccrime	2.27	0.440904
ccontrol2	2.12	0.470692
ccommunity	1.88	0.532590
clearns	1.77	0.563628
cotherwomen2	1.45	0.689131
cfight2	1.40	0.715061
crelatstat	1.33	0.752101
Mean VIF	2.44	

Likewise, tests for heteroskedasticity, including the White's test and the Breusch-Pagan test, both confirm that the variance of the residuals are homogenous. Both of these strategies test the null hypothesis that the variance of the residuals is homogenous. If the p-value is very small, we would have to reject the hypothesis and accept the alternative hypothesis that the variance is not homogenous.